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THE
INTERNATIONAL DENTAL JOURNAL

A MONTHLY PERIODICAL

DEVOTED TO

DENTAL AND ORAL SCIENCE.

EDITED BY

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VOL. XIV.

INTERNATIONAL DENTAL PUBLICATION COMPANY,
NEW YORK CITY AND PHILADELPHIA.
1893.

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THE International Dental Journal.

VOL. XIV.

JANUARY, 1893.

No. 1.

Original Communications.¹

THE DOCTRINE OF INFLAMMATION.²

BY C. F. W. BÜDECKER, D.D.S., M.D.S.

It is with a great deal of pride that I appear before you this evening to explain and vindicate some of the latest so-called discoveries in regard to the minute changes in the tissues during the process of inflammation. The discoveries of my highly-esteemed teacher—our friend and honorary member of this society, Dr. Carl Heitzmann—are on record. It would hardly seem possible that they could have been overlooked in Germany, and yet this is the case. To some of you his ideas in regard to the minute structure of the tissues have appeared rather queer,—nay, ridiculous; but I hope the time is near at hand when our friend will receive his greatly-deserved acknowledgment for his hard labor upon the field of histological research. It was with some hesitancy that I concluded to bring before you a subject which, I am sorry to state, to some of you may seem uninteresting or impractical. If, however, we consider that we are specialists of medicine, we must admit that the more we know of the fundamental principles of histology and pathology, the better we are prepared to correctly diagnosticate and treat the various pathological disturbances presenting them-

¹ The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

² Read before the New York Odontological Society, November 15, 1892.

selves in our daily practice. In order that you may be able to comprehend the differences in the opinions of the authors, I shall be obliged to dwell at some length upon the several theories in regard to the minute structure of the tissues involved in the process of inflammation.

For centuries the clinical features of inflammation have been known to the surgeon. Swelling, redness, heat, pain, and impaired function were considered to the naked eye as its typical phenomena. Quite different is the aspect of the inflammatory process if we consider the question, What are the changes in the tissues thus affected? Since the query can be answered only by a study with the microscope, it is plain that the history of inflammation is almost identical with that of histology.

Fifty years ago the symptoms of inflammation apparently coincided with what could be seen with comparatively low powers of the microscope. The web-membrane of the frog was fastened upon a piece of cork, hollowed out. A drop of caustic ammonia was applied, or it was touched with a red-hot glass rod, and the result of the irritation was observed mainly, if not exclusively, in the vascular system of the web-membrane. The current of the blood, which was seen to be normal before the irritation, soon afterwards became irregular and slackened, then oscillating to and fro, and at last arrived at a complete standstill,—the so-called “stasis.” Most of the pathologists agreed that by the irritation a rapid contraction of the vessels was produced, soon terminating in a paralysis of the walls of the blood-vessels, which latter did not offer any resistance to the pressure of the blood-current. At the same time an inundation of the tissues of the web-membrane with a liquid had occurred, often mixed with extravasated blood, and after twenty-four hours a number of granular corpuscles were seen suspended in the liquid, which was termed “exudate.” These corpuscles or cells were thought to have originated in the exudate itself, and were named “exudate-cells.” The process of inflammation was evidently a disturbance in the blood and the blood-vessels, and, since all diseases at that time were attributed to a certain mixture or crisis of the blood, the pathologists holding these views were called “humoral” pathologists, with whom all diseases were due to a faulty mixture of the blood,—so-called “dyscrasia.”

In order to understand the views of the humoral pathologists, we must take into consideration the discovery of the cells in plants by Schleiden in 1837, and in animals by Theodor Schwann in 1839. In the minds of these observers both the vegetable and the animal

organism were composed of cells and their derivations,—viz., inter-cellular substance. The cells were considered individuals, composed of a vesicle, liquid or semi-liquid contents, and a central nucleus. Millions of such cells were thought to build up an organism. Each cell could originate spontaneously from an albuminous liquid by the formation of, first, the nucleus, and afterwards the cell-wall, in the shape of two watch-glasses held together, and at last an accumulation of liquid within the vesicle, the cell-wall. The pathologists at that time held the opinion that the exudate-cells originated directly in the liquid exudate, which, as a matter of course, came from the blood-vessels, and was considered a modified blood-serum.

The views of the humoral pathologists of the Vienna school, who were guided by Rokitansky, were overthrown, in 1851, by the well-known great man, Rudolph Virchow, at that time in Würzburg, and at present in Berlin. Virchow was the founder of the cellular pathology. He stated¹ that a cell was provided with a wall of its own, held a viscid albuminous liquid, and was the seat of life, which was not so considered by Schwann nor the Vienna school. Virchow held and still holds the views that the organism is composed of a large number of individual cells, separated from one another by an intervening intercellular substance, which he considers to be a product of secretion of the cell. He, however, acknowledged one variety of interconnected cells, termed star-shaped or stellate, such as we know to exist in the myxomatous tissue. With Virchow the vascular disturbances in the process of inflammation were of secondary importance. Instead of an inundation of the tissues with exudate, he admitted only a surplus of nourishing liquid, directly attracted by the cells. He denied the origin of cells from the exudate, but maintained that every cell originated by proliferation from a previous cell. The pus-corpuscles he considered an offspring of the tissue-cells, principally of those of the connective tissue. His assertions were based upon the fact that the tissues lacking blood-vessels, such as the cornea of the eye, could be brought to inflammation and supuration. The cellular pathology held sway of the minds of pathologists ever since, and is even in our day accepted as the leading doctrine in Europe as well as in this country.

In 1861, Max Schultze,² of Bonn, Germany, announced novel views in regard to the construction of cells. He denied the existence of a cell-wall, and said that a cell is a lump of protoplasm

¹ "Die Cellularpathologie." Berlin, 1871.

² *Müller's Archiv*, 1861.

holding granules and a nucleus, endowed with the properties of life. The word "protoplasm" was accepted by him from the botanist, Hugo von Mohl, who, several years before, applied this term to the contents of vegetable cells. In England, L. S. Beale¹ almost simultaneously announced similar views, applying the term "bioplasma" to the substance which builds up the cells. This bioplasma was the true living or germinal matter, whereas all intercellular substances he considered as inert or formed material. Unfortunately, he was led to term the muscles and nerves "formed material" also, and yet these tissues are known to be the most active of the organism. It is for this reason that Beale's views have attracted but little attention.

Max Schultze's assertions did not directly affect the cell-doctrine, although he admitted that the term "cell" had lost its significance, and may be applied only in honor of its discoverers, Schleiden and Schwann. M. Schultze, at the same time, announced novel views concerning the origin of the intercellular substance, which must be understood in order to trace the development of the modern researches in the process of inflammation. In the views of Virchow the intercellular substance was merely a secretory product of the cells, whereas Max Schultze proved that these substances were derivations of protoplasm. With him a number of protoplasmic bodies become chemically transformed into basis-substance, and thus they are rendered inert, and dead. Beale's doctrine was different, since he said that an originally large mass of bioplasma is converted at the periphery into formed material, and only the central portion remains, forming or germinal matter.

Soon afterwards, E. Brücke, of Vienna, asserted that neither the granules nor the nucleus were essential features of a cell, and consequently he defined the cell as a structureless lump of protoplasm, eventually destitute of granules and a nucleus. The expression "structureless" certainly indicated, not that a structure was absent, but that it could not be made out with the microscope. He likewise admitted that a lump of protoplasm is the real seat of life, and is able to produce new lumps,—i.e., new cells,—by proliferation and division in normal development of the tissues as well as in morbid processes.

Such was the doctrine up to the middle of the seventh decade of our century, when, in 1867, the whole aspect of inflammation became revolutionized by J. F. Cohnheim.² This observer saw in the

¹ "On the Structure and Growth of the Tissues." London, 1865.

² *Sitzungsberichte der Wiener Akademie der Wissenschaften*, 1861.

expanded mesentery of a living frog an emigration of colorless blood-corpuscles through the walls of capillaries and small veins. The observation as such was not novel, since Waller, of England, as early as 1846, had published it without attracting attention. Cohnheim soon afterwards (1869) declared the process of emigration of leucocytes to be the essential feature of inflammation, to such an extent that exudate-corpuscles and pus-corpuscles were to be considered identical with emigrated colorless blood-corpuscles or leucocytes. He denied that the so-called fixed cells of the connective tissue shared in the process of inflammation by proliferation in the sense of Virchow. According to Cohnheim, the tissues, including their cells, simply perish, and the whole inflammatory infiltration is due to an accumulation of leucocytes.

Cohnheim never proved that the emigration of leucocytes is really due to the inflammatory process. On the contrary, it was proved by himself that, in any stagnation of the blood-current, an accumulation of leucocytes occurs inside of the blood-vessels along their walls, followed by an emigration of these corpuscles. It was furthermore proved that the emigrated leucocytes remigrate into the lymph-vessels, and are thus removed from the tissues. Nevertheless, upon the authority of Cohnheim, a large majority of German pathologists accepted the emigration theory. A pupil of Cohnheim, C. Weigert, went so far as to assert that the leucocytes creep into the fixed connective tissue and epithelial cells, thus causing the delusive image of proliferation in them. Many of the younger pathologists have tried hard to show that an aggregation of leucocytes will lead to a new formation of tissue, both in plastic inflammation and in the formation of tumors. All these attempts, however, have proved fallacies, and all reasonable followers of Cohnheim agree in that emigrated leucocytes never produce new tissues.

The most zealous opponent to Cohnheim's views was S. Stricker, of Vienna, who, in a number of accurate observations,¹ has proved, since 1870, that the fixed cells and their coarser offshoots break up into embryonal corpuscles, furnishing the inflammatory infiltration, which is the outcome of proliferation of the tissue-cells themselves. Stricker called all newly-appearing elements "pus-corpuscles," and this nomenclature seems to have greatly enhanced his assertions. In his article on inflammation in "*Ashhurst's International Cyclopædia of Surgery*," he speaks only of pus-corpuscles as products of inflammation. Still, every practitioner is aware of the fact that

¹ *Wiener Medic. Jahrbücher*, 1870-80.

not every inflammation terminates in suppuration; that, on the contrary, many inflammatory processes lead to a new formation of the inflamed tissue,—the so-called hypertrophy or hyperplasia,—and by no means in a destruction of the tissue which is the result of suppuration. Stricker, however, since 1880, has become a convert to the views advanced by his former pupil, Carl Heitzmann. Stricker publicly announced that it required six years of microscopical work before he could confirm Heitzmann's assertions, which he admitted to be adverse to the cellular pathology established by Virchow.

In 1873, Carl Heitzmann, at that time in Vienna, published a series of articles in the Vienna Academy of Sciences¹ with entirely novel discoveries, concerning the structure of protoplasm, the structure and origin of the basis-substance, and the process of inflammation. Since, by personal studies in the laboratory of this observer, I have become convinced of the correctness of his assertions, I take the liberty to explain them more fully than I have done on previous occasions. These views are contradictory to the cell-doctrine and the cellular pathology to such an extent that the latter, to-day, seem to have merely an historical value.

Carl Heitzmann maintains that a cell, or a lump of protoplasm, hitherto considered structureless, is indeed possessed of a pronounced reticular structure. Since he had seen this reticulum in continuous change of place and shape during the locomotions of living protoplasmic lumps, such as amebæ, colorless blood-corpuscles, etc., he called the substance which builds up the reticulum the living or the "contractile matter" proper. Formations of living matter, according to Heitzmann, are the nucleus, the granules, with their interconnecting threads, and an extremely thin layer, enclosing the lump of protoplasm all around. At first the existence of the reticulum was denied by most observers, and afterwards, when they could not any longer deny its existence, they said that it was not original with Heitzmann, but was discovered by C. Frommann in 1867. Frommann, it is true, speaks of a reticulum in connective tissue and in ganglionic cells, but without giving an illustration thereof. He afterwards declared that he had never used lenses of a higher power than four hundred and fifty diameters. To observe the reticulum in the protoplasm with such a power of the microscope is simply impossible, even to an experienced eye. Eight hundred to one thousand diameters are indeed required for the

¹ *Sitzungsberichte der Wiener Akademie der Wissenschaften*, 1873.

study of the reticulum under consideration. That the reticulum exists is to-day a settled fact, the more so as Stricker, in 1890, has succeeded in reproducing it by photography in a living colorless blood-corpuscle of the proteus by means of the electric microscope, with a power of two thousand five hundred diameters.¹ In this photo-micrograph the reticulum in the protoplasm is exactly the same as discovered and described by Carl Heitzmann in 1873.

That the nucleus is made up of living matter became apparently doubtful when, in 1875, the so-called karyo-kinesis of the nucleus was discovered by Strassburger, Bütschli, Flemming, and others. It was shown that the nucleus is composed of loop-like threads representing stars and double-stars preceding its division. Since these loops could be stained deeper by certain aniline dyes, especially saffranin, than by the granules of the protoplasm, it was asserted that the nucleus is composed of a substance of its own, called "nuclein and chromatin." It is plain that a substance capable of changing its shape and place must be living matter. The karyo-kinetic threads assumed a deeper color only on account of their being more bulky than the rest of the reticulum in the surrounding protoplasm. Besides, it was shown that even at the height of karyo-kinesis, the loops remain interconnected with the surrounding reticulum of the protoplasm, which again proves their identity. Not only do all movements occur in consequence of contraction and extension of the reticulum, but all new formations and outgrowths start from this substance respectively from the granules, the points of intersection of the reticulum. This again proves that the reticulum is the living matter proper, in the meshes of which there exists a liquid, probably holding nitrogen, but, being a liquid, not endowed with the properties of life.

Originally every so-called cell is a solid granule of living matter, which in turn becomes vacuolated by an accumulation of liquid and, at last, is reticulated, in consequence of perforations of the walls of the vacuoles.

Another discovery of Carl Heitzmann, in 1873, has been that the intercellular, or basis-substance of the connective tissue, is not dead or inert, as hitherto supposed, but is alive in the same sense as the cells themselves. The reticulum of living matter present in the latter is present also in the basis-substance, rendered invisible by chemical changes and a solidification of the originally liquid contents of the meshes in the protoplasm. It was proved that in

¹ *Audien aus dem Institute für experimentelle Pathologie*, 1890.

all varieties of connective tissue in the muscles, the nerves, and in the epithelia, the so-called cells are interconnected by means of delicate threads of living matter, or indirectly by the reticulum pervading the basis-substance.

In the development of all varieties of basis-substance the protoplasm shares by process of chemical transformation which renders it more or less firm and solid. It also was proved that in the formation of basis-substance the protoplasm does not perish altogether; but only the lifeless liquid portion which is held in the meshes of the reticulum becomes solidified, whereas the reticulum itself remains unchanged. The correctness of these views are shown in the process of inflammation as well as in the history of the development of the hard tissues of the teeth, such as the dentine, the enamel, and the cementum.

I have dwelt upon the structure and the development of the basis-substance at length, in order to render explicable the process of inflammation as established by Carl Heitzmann, in 1873. He has shown at that time that in inflammation, as well as in the growth of tumors, not only the free protoplasm, the so-called cells of Virchow, participate, but also the basis-substance. It is the living or contractile matter which alone is capable of growth; of an increase in bulk. Since this substance is stored up both in the cells as in the basis-substance, nothing is required but a dissolution or liquefaction of the latter, in order to liberate the living matter which, being reduced to its embryonal condition, shares in the outgrowth of the inflammatory products as much as do the cells themselves.

Inflammation may terminate either in resolution or in hyperplasia, or in suppuration.

Resolution occurs when the inflamed tissue is again infiltrated with basis-substance, and thus the previous condition is re-established with such a degree of perfection that no vestige is left of the former morbid process.

Hyperplasia appears when, in consequence of the increase of the living matter after the new formation of basis-substance, a certain bulk of tissue is formed in excess of its previous normal amount. In this condition the cells as well as the basis-substance remain interconnected the same as in the production of a normal tissue.

Suppuration is the result of the breaking asunder of the interconnections of the protoplasmic bodies from an inflamed tissue which has been reduced to its embryonal condition. As the result of such a separation we observe the appearance of isolated protoplasmic bodies, or pus-corpuseles. Pus, therefore, is a disintegrated tissue,

and by no means a dead tissue, as claimed by some. Nothing is dead in the process of suppuration, since every pus-corpuscle remains alive, and, in a fresh condition, is seen to perform amœboid movements, if kept in a fluid not adverse to the life of the pus-corpuscle, such as warm urine or serum of blood. Death means necrosis, and every practitioner knows that between suppuration and necrosis there is a pronounced clinical difference, although a necrotic tissue will cause suppuration in its surroundings, but only for the purpose of being eliminated from the living organism.

All these varieties of inflammation occur in both the soft and hard tissues of the teeth and their surroundings. We meet with it in caries, in eburnitis, in the various forms of pulpitis, alveolar abscess, pyorrhœa alveolaris, as well as in exostosis.

At the beginning of 1892, P. Grawitz, professor of morbid anatomy at the University of Greifswald, Germany, published an article,¹ followed by several others, in which he claims to have discovered that in the process of inflammation not only the cells of the connective tissue proliferate, but the basis-substance likewise furnishes a large amount of cells, which he terms slumbering-cells. Grawitz believes that the basis-substance has been developed from cells which remained slumbering until again brought to view by an irritative process, such as inflammation. E. O. Shakespeare, of Philadelphia, in 1882, had previously written of slumbering-cells, which he noticed buried in the basis-substance of the cornea. Quite recently Professor C. Weigert, of Frankfurt, Germany, bitterly attacked Grawitz,² calling his discovery "intercellular pathology," in contradistinction to Virchow's cellular pathology. He criticises Grawitz that the latter has ignored the researches of inflammation during the last twenty years, and quotes Stricker as having first discovered that during the process of inflammation the basis-substance likewise produces cells. Weigert, however, still adheres to Cohnheim's emigration-theory, and has never admitted that the connective-tissue cells do proliferate. He tries to explain the images of proliferation by stating that the colorless blood-corpuscles, or leucocytes, creep into the tissue-cells, thus producing the appearance of proliferation. Grawitz admits that he is ignorant of these researches. Weigert, on the contrary, confesses the knowledge of Stricker's publications, but purposely ignored them, because they were adverse to the doctrine of the Cellular Pathology.

¹ *Virchow's Archiv. Berliner Wochenschrift.*

² *Deutsche Medic. Wochenschrift, 1892.*

It is remarkable that the German pathologists have arrived at discoveries which were made twenty years ago, not by Stricker, as stated, but by Carl Heitzmann, of New York, at that time in Vienna. Stricker himself publicly announced in 1880 that he became convinced of the views of Heitzmann only after six years of hard work. He unquestionably was the first in Europe who acknowledged (twelve years ago) the accuracy of Heitzmann's theory. The discovery, however, is not his.

We, in this country, have been acquainted with Heitzmann's views for the last eighteen years, and I have done my share to prove their correctness and simplicity for the last fifteen years. All this work was simply ignored, especially in Germany, and apparently for no other reason than adoration of Virchow's person and Virchow's views. It is with pride that I can say that we in this country have been ahead of the Europeans for the last eighteen years. It is only recently that they began to realize the truth in the process of inflammation, although they still try to compromise the facts with the doctrine of the cellular pathology, and it will certainly take some time yet before the German pathologists will admit that the *cell-theory* as well as the *cellular pathology* are fallacies.

In conclusion, since most pathologists and dental practitioners seem to be unable to comprehend Heitzmann's views, you will pardon me if I occupy a little more of your time and explain by sketches upon the black-board the formation and dissolution of the basis-substance of connective tissue, bearing directly upon the theories of Virchow, Stricker, and Heitzmann.

SHOULD EXAMINING BOARDS HAVE POWER TO GRANT CERTIFICATES OF QUALIFICATION TO UNDERGRADUATES?¹

BY LEWIS JACK, D.D.S.

THE question is one of extreme consequence to the cause of dental education, and demands from us and from any body of dentists essaying to discuss it the most careful, exhaustive, and judicious consideration. The wording of this question probably does not go sufficiently far. It should have included in its

¹ Read before the Odontological Society of Pennsylvania, November 18, 1892.

verbiage the further inquiry whether the protective influence of law should cover any form of qualification for practice except that which is given by compliance with the fullest curriculum of the dental schools. In other words, the term undergraduate should include every one who is not a graduate of a dental school. Such was the intention in the mind of the proposer of the question.

Therefore my argument before you in opening this discussion will include both classes of those who may apply to the Examining Boards, and those who have been self-taught, and those who have attended one or two courses of instruction.

I have examined the laws of the various States, principally as they are reported in Rehfuß's "Dental Jurisprudence," and find the following States give any person the right without qualification to demand an examination as to their attainments,—viz., Alabama, California, Colorado, Delaware, Georgia, Illinois, Indiana, Iowa, Louisiana, Maine, Massachusetts, Michigan, Mississippi, North Carolina, Oklahoma, Pennsylvania, Rhode Island, South Carolina, Tennessee, Texas, Vermont, Virginia, Washington, West Virginia, Wisconsin.

The following States qualify this privilege by requiring evidence of previous study: New Jersey makes five years' preparation a necessity. New York if a "period of four years of regular study has been pursued." North and South Dakota each require "three years' previous study under the supervision of some regularly practising dentist."

The States which do not examine such persons are Arkansas, Kansas, Kentucky, Maryland, Minnesota, Missouri, Nebraska, and Ohio.

It is thus to be observed that the laws of twenty-eight States permit the examination of non-graduates, and that those of eight States do not authorize the examination of persons unqualified by the various schools.

The fundamental principle concerned in the requirement that the Examining Boards may give certificates to practise to those who are not regularly qualified, is based on the probability that there may be some who have made the necessary preparation to render intelligent service, and who may not have enjoyed the advantages of school training, and that, therefore, these should not be excluded from the enjoyment of the inherent right of man to freedom in the pursuit of business. The probability of the existence of such a class of persons, even in the most intelligent communities, is so remote that the injury caused by the relinquishment by the public of the right of any person to an examination is slight in comparison

with the damage which may be inflicted by its retention. This being so, there can be no great importance to be attached to the existence of this privilege.

From the experience of the past, the liability to leniency of the Examining Boards granting certificates of qualification to indifferently prepared persons is a constant menace. It is a source of contention by the teaching Faculties and a ground of contempt for the boards. The fault is in the law, of which the boards are the executors; but the fact remains that Examining Boards invest men with the rights which the Faculties consider three years of exhaustive study as no more than sufficient to prepare them to enjoy.

The general purpose of the dental laws, which have become of nearly universal enactment, have for their first effect the protection of the public from the injuries which may be inflicted upon the members of it by incompetent persons. The immediate secondary result is to induce those contemplating the pursuit of dentistry to make the necessary effort and personal sacrifice of time and money to pass through the required steps to secure thorough training. The result of the latter force is what has been in the minds of those who have proposed and brought about the approval of the dental laws. For this reason these laws have been a benefit to the public, an unmeasurable advantage to the schools, and have proved immensely beneficial to the character of dentistry as a liberal pursuit.

The presence of the principle, however, that any person may come forward and submit to an examination has had a demoralizing effect upon many who, without this opportunity, would have had no other course open than either to undergo a college preparation or abandon the attempt.

No one can indicate how many have in the various States carried on their attempts to practise with the vain hope that they could prepare themselves for examination, and have in the mean time gone on surreptitiously practising when there appeared little danger of being disturbed by their neighbors.

My views upon the next to impossibility of any person of the class indicated making a creditable examination have been long entertained, and have become strengthened by my experience on the Examining Board of this State. In the two terms I acted not a candidate could, on my subjects, answer correctly the most elementary questions. For instance, on the subject of dental histology, I have yet to get an approximately correct reply to the question, "What is the character of the structure of the mucous

membrane?" Of course the genesis of tooth-tissue can have no place in the mind of a student who cannot answer this query. In dental anatomy I have yet to receive a satisfactory definition of the three hard structures which enter into the teeth. From my examination of such candidates I have been forced to the conclusion that the examination is simply useless, and that the requirement that boards shall entertain their demands is a waste of time. It is objectionable because it is unreasonable in the face of the facts; it borders on the absurd because it is fruitless.

In too many instances, when persons of this class have been given the certificate to commence or to continue practice, they have been an injury to the neighboring practitioners in ways scarcely necessary to recount here.

There remains the further question of the injustice of such persons being admitted to practice. The college student who has spent his two or more years at a large expense in a distant city for qualification finds himself confronted by another who has the same rights under the law, who at a few dollars' outlay has procured this privilege and protection, and who, not having the air of professional honor about him, has poisoned the atmosphere in various ways by degrading methods of conducting practice, accompanied in some instances with the pretension that the certificate gave greater claims because it was the result of an examination by a board of men under the authority of the State and the auspices of the State Dental Society.

This much being stated should be sufficient to conclude the question of the impropriety of this qualifying process.

While it may have had some justification in the early legal regulation of dentistry, since at that time it would have been difficult to procure legislation without granting this right, it certainly is not in consistency with the views of leading men. The new laws as they are amended should withdraw this privilege. That it may be done is conclusively proven by the fact that, as alluded to above, eight States require graduation as a qualification to enter practice; and as no legal question upon this point has arisen, so far as we are aware, it may be taken for granted that no impediment has been encountered.

When we come to another class of persons, those who have attended two years of school training, who may be offering themselves ere long in the States which are required to examine any who may present for certificates, the discussion assumes a still more serious aspect.

The expression of opinion by leading dentists that the curriculum of the dental schools required enlargement and the period of study extension, with the concurrent action of the schools and the Association of Dental Faculties to the same effect, resulted in improved courses of study in some of the schools, and the enforcement by the Association of Faculties upon their associates of the three-years' term of instruction. This enlargement of the course of study had the support and encouragement of the National Board of Examiners, and marks an important advanced step in dental education. The danger of this action being weakened by the obligation of the Examining Boards in so many States to make examination of any undergraduate who may present for this test, makes the question now before us an extremely important one. It is readily perceived that it will tend to weaken the cause of dental education, and is a menace to the three years' course of instruction. How far students who have completed the second year may attempt to shorten their period of instruction by resorting to an attempt to procure certificates of qualification by applying to the boards for an examination is an uncertain factor, but the probability of such a course, even the possibility of it, should occasion alarm to the friends of extended dental education. The opportunity for the accomplishment of such a result is a menace, and needs the correcting influence of public opinion to remove the chances.

The general tendency and the undercurrent force of the dental enactments regulating the practice of dentistry is to bring about improvements in the dental curriculum, to increase the importance of dental services and enlarge the self-respect of those engaged in practice. In view of these important ends which are involved, it is extremely illogical to entertain the propriety of examining undergraduates in the manner indicated. Such a course would be begging the whole question of dental education, and implicates every one who is concerned as a participant in curtailing the benefits to which every honorable man, who regards the good of his profession, is committed.

The injurious effects upon the morale of the dental profession would appear a greater evil than the examination of mere novices.

It would produce distrust of the Examining Boards upon the part of the Faculties, would weaken the integrity of the individual offering himself for examination, and being so inconsistent with the tendency of the times which demands more exacting preparation,

that mental confusion and moral distress must be the inevitable result.

Examining Boards may have an understood policy which may render it difficult for any one to pass their ordeal, but it appears there can be no safety for the schools of the dental profession until the laws are modified to make it impossible to get a certificate of qualification from a Board of Examiners alone.

As the schools are now entering upon the regular three years' course of study, there is abundance of time for the various State societies to make application for such amendments of the dental laws as will repeal the privilege of examining non-graduates.

Certainly it cannot be too much for this Society to express its sentiments to the Pennsylvania State Dental Society, through its committee on dental laws, that the new or amended law about being prepared for approval in Pennsylvania should include such provision as will remove the privilege to grant certificates of qualification to any person who is not a graduate.

A similar request sent to the officers of the various State Dental Societies would also be of service to the same end.

This subject will be presented to the many local societies for discussion in the same form it has been given to this Society, and while it is a fresh topic is the proper time to give it prominence by an endeavor to produce concurrent action in the States which will benefit by the proposed amendment.

A BRIEF REVIEW.¹

BY DR. BENJAMIN LORD, NEW YORK.

It will be remembered that Dr. I. B. Davenport, of Paris, some five years ago contributed to our Society what was regarded as an able paper on the teeth and jaws, in which he considered quite fully the question of the retention or extraction of the sixth-year or first permanent molars.

At the annual meeting of the British Dental Association, held at Manchester, England, in August last, the principal subject considered, as I understand it, was the treatment of the particular teeth just alluded to, and at that time Dr. Davenport delivered an

¹ Read before the New York Odontological Society, November 15, 1892.

address in which he expressed views practically identical with those contained in his paper read before this Society,—viz., advising the retention of those teeth in almost every case, and giving his reasons in full for such an opinion.

I do not propose, by any means, to go over any considerable part of the discussion of this subject on the occasion named ; but I have thought that some allusions to it would be of more or less interest, and perhaps profit.

The discussion, which was entered into by a goodly number of the members of the Association, took a wide range, as was natural in view of the preliminary remarks of the president, Mr. H. C. Quinby, who, by the way, is an American, and I believe very well known to many in this Society.

I may quote a few sentences from the remarks of Mr. Quinby at the opening of the discussion. He says, "This subject may be described, generally, as the treatment of irregularities and overcrowding of the human teeth. But the special subject for our discussion this morning (one which is necessarily well represented in this museum) is the tendency of overcrowding to promote the destructive effects of caries ; and whether it may be justifiable as a conservative measure, in cases where we see indications of danger to the youthful dentine from this cause, to remove an upper and a lower tooth from each side of the mouth, with a view to the giving of more space to the anterior teeth, permitting them to separate, and, as nearly as possible, isolate themselves, thereby preventing the inception of carious disease in such teeth as have not already been attacked. If such a measure is justifiable, which teeth should be selected for extraction, so as to give the necessary relief, and when would be the best time for the extracting to secure the best results for the future of the mouth ?"

Dr. Davenport, in his further study of the subject, said at the beginning of his address, "The discussion of the question of extraction of the sixth-year molars I have always approached from a general stand-point, leaving out my wearisome search amidst the darkness and chaos of imperfect organs and imperfect results of individual cases, where, if one were found which seemed to be explained or explicable, or referable to a principle, the next would very likely contradict it."

I may here say that I believe that all who will take the trouble to read Dr. Davenport's address will find in it much that is valuable.

The discussion of the subject by the various members of the

Association who took part in it showed a great deal of interest and much well-considered thought. It also exhibited a degree of intelligence that could only come from a careful study of the question under consideration; and we are forced to concede that they are better students over there than we are here.

An important aid in the discussion, and particularly in illustrating the various effects of treatment, was furnished by a large number of carefully-made models, contributed by many dentists and arranged by Mr. G. G. Campion. It was decided, however, that in order best to show and illustrate the effects of extraction, whether favorable or not, casts should be made, both before and after the operation.

It must occur to us all, Mr. President, that there is here a suggestion and a lesson that we should do well to take up and act upon, in order to derive the greatest advantage, both for ourselves and for those who shall come after us. Can we not at once set about securing models of all cases where extraction is resorted to or found to be imperative, both before and after the operation?

In this communication scarcely any idea can be given of the scope of this discussion; but I am very glad to be able to say that the strongest arguments were in favor of retaining all the teeth that can possibly be preserved. Of course, however, when we come to the treatment of abnormal conditions, we are often obliged to choose between the least of two evils.

I believe that the consensus of opinion was that in cases where it is found imperative to remove the sixth-year molars, it should by no means be done until after the full eruption and occlusion of the twelfth-year molars; this is certainly, in my opinion, a most wise practice, although some would extract much earlier. All seem to have been in favor of extracting antagonizing teeth, and to have held that, whenever it is decided, for any cause, to remove a molar from either the upper or the lower arch, the opposing or occluding tooth should also be removed. I believe, on the other hand, that it is better to lose one tooth than two, and that, as a rule, there will be less loss of grinding surface from the tilting or tipping of the teeth, if the opposing teeth are allowed to remain. There was not a word said about preserving the roots of the sixth-year molars in cases where the crowns could not be saved. I think it preferable, in all cases where the roots can be preserved in a healthy, or even a fairly healthy condition, to do so; as the tipping of the remaining teeth is thereby prevented, and it is the tipping of the teeth which causes more loss of masticating surface than results from the loss

of the crown that has broken away. Other evils also follow the removal of the roots, such as the shortening of the arch, and the weakening of the adjoining teeth from the loss of the alveoli.

Mr. Quinby, the newly-elected president of the Association, closed as well as opened the discussion. For the most part he is much in favor of extracting as a conservative treatment; and he endeavors to justify his opinion by giving a great many reasons for it, and by presenting the subject in many aspects. I may read two or three sentences from his remarks, giving his views and practice in regard to extracting, which I believe, however, are not altogether justified by the experience of those of us who have given the most thought and attention to the subject.

He says in his address, in regard to his official position and his recommendation in practice, "I stand here, to-day, in the most responsible position in which you can place me, and because of this,—because what I say here will have more emphasis than it could have from any other place in the gift of the profession,—because I have been asked by students whether, after all the adverse arguments by some of my American colleagues, I still adhere to my doctrine of prevention by space,—I want to repeat from this chair the advice I have so often given to young practitioners when they meet with cases of rapid approximal decay in the permanent incisors and bicuspid, at or before the twelfth year, and especially when the family history indicates delicate teeth. It is this: Do not have the slightest hesitation in recommending the extraction of the sixth-year molars as soon as the twelfth-year molars are sufficiently advanced to be in occlusion, the object being to give space for distinct separations between all the anterior teeth."

Mr. Quinby's inaugural has many good points, and contains much that we might do well carefully to consider, and grow wiser and better by the consideration. He is severe in some of his criticisms and denunciations of the conduct and practice of some among us, and of the so-called "American" dentist abroad; but perhaps he has seen and known enough to warrant all that he says. Yet it may be that he, being an American, has felt at liberty to say more than he otherwise would, more perhaps than some of his English confrères would endorse.

It is not to be presumed that America wishes to be, or should be, held responsible for all dentists who call themselves "American" dentists. Some of our schools have no doubt graduated men who know next to nothing about dentistry, practically; and if they have thus disgraced themselves and the profession, the responsibility and

the odium should be placed where they belong. I will quote a few sentences further from Mr. Quinby, which are near the commencement of his address :

“I trust you will pardon me if I call your attention for a few minutes to some of the causes of the change that has taken place in the estimation in which American practice is held now, compared to what it was forty years ago. I wish to speak of some of the phases of what I must call unprofessional conduct, which have brought discredit upon American dentists abroad and at home,—a discredit which is deeply felt by all the earnest, conscientious members of our profession (and it is scarcely necessary to say that there are many such in America), who will always jealously defend the interests and prestige of our specialty, both there and everywhere.”

After discussing and denouncing the practice of securing patents for various kinds of implements, methods, and appliances, he says, “These are, I believe, some of the reasons why the word ‘American,’ used as a prefix to dentistry, constitutes almost a term of reproach, for on this side of the Atlantic it has become, I am sorry to say, synonymous with the veriest chicanery and humbug; but America has not ceased, and I hope will never cease, to produce dentists who are honorable men, and who will cordially agree with the sentiments of a late letter in the *Times* by a distinguished member of this Association, who says, ‘Dentistry, like medicine and surgery, is catholic, and is practised by honest men for the public good, and therefore all its methods are made public to all members of the profession.’”

Dr. Quinby’s address contains almost a complete record of the many objectionable features connected with the practice of dentistry all over the world by the “camp-followers” and imitators of American dentists. Bogus diplomas, patented instruments and methods, the sale of State and county patent-rights, advertisements of peculiar treatment and claims of special skill in the public press, all receive merited and scathing denunciation at Mr. Quinby’s hand.

Remembering the official action of the New York Odontological Society against the patenting of instruments or methods, and because of the exclusion of all reference to the same from our published proceedings, I feel that I but express the sentiments of at least a large majority when I commend Mr. Quinby for all that he has said against such unprofessional conduct.

I also take pleasure in assuring him that the true American dentist,—by which I mean the skilful, conscientious, tooth-saving practitioner,—joins him in condemning all such practices, and would

inform him that by both example and precept, and by stringent dental law, the effort is being made, and with fairly satisfactory results, to rid the profession in this country of these objectionable features.

It is strange that so good a thinker as Mr. Quinby evidently is should have overlooked the great forces which are at work for the purification of the dental profession in the United States, among which the Dental Protective Association and the excellent dental laws of many of our States naturally come first; and the labors of Dr. H. C. Meriam in his crusade against the patent evil must not be forgotten.

Unfortunately, I think, for Mr. Quinby's logic, he has found in his well-arranged list of professional sins committed by quacks and charlatans, masquerading as American dentists, an excuse for a rather wholesale condemnation of American dentistry at large. But we find that in practical life the most successful men have the greatest number of imitators; the best artist's pictures are copied; the most pleasing architectural results are followed in the reproduction of cheaper and less meritorious works; and all because of that never-failing homage which men of all countries and professions, with native shrewdness, pay to success and skill.

Were the standard of practical dentistry as high in any other country as it is in America, quacks and non-professionals would now be masquerading as Russian dentists or Swiss dentists, or, begging Mr. Quinby's pardon, as English dentists.

May it not be considered surprising that Mr. Quinby, being an American, should give expression to such views, notwithstanding that England has been his adopted country for many years, and that the influence of environment can be understood? Yet, is he justified, even at his distance from his native land, in expressing his opinions of the status of the profession here in such sensational phrases?

I have already in this little paper paid a merited tribute to the scholarly attainments of English dentists, and I am quite ready to agree with Mr. Quinby's high estimate of their qualifications, so far as theoretical knowledge is concerned; but it is to be hoped that his words of praise will not cause them to slacken their efforts to add to their manipulative skill.

A STUDY OF SOME OF THE CAUSES OF FAILURE IN DENTAL OPERATIONS—A PLEA FOR MORE SCIENTIFIC PROFESSIONAL METHODS.¹

BY L. ASHLEY FAUGHT, D.D.S., PHILADELPHIA.

MR. PRESIDENT AND GENTLEMEN.—It is my privilege and pleasure to address you to-night upon what has been to me a cherished hope; and I earnestly desire to bring to you a message which shall impel the adoption of such methods of practice as will make that hope a living fact. I do not look for any immediate result, but I believe that concerted action relative to them now will not be without its impress upon the possibilities of the future.

On the 21st day of April, 1885,—a few days more than just seven years ago,—in a paper read before the Odontographic Society of Pennsylvania,² I placed before the profession "The Legal Standing of Dentistry," and have since labored incessantly to secure to it that status. Others, too, have entered most heartily upon the work, and not a little of what was then advocated has been accomplished; but the real and vital point is still unattained. A true, separate, legal standing as a profession does not exist. We can but pretend to-day to an advancement towards it, and this advancement is to be helped by the use of more scientific professional methods.

You will, therefore, perceive that I desire not only to interest you in a study of some of the causes of failure in dental operations, but that I also mainly wish that interest to lead to a general adoption of more scientific professional methods, to the end that the legal standing of dentistry may be secured.

That I may not be accused of making mere assertion of the premise,—no legal standing,—I may be allowed to tersely recall to your minds and to my own the outlines of the position.

The relative aspects of dentistry are, the relation of dentists to dentistry, the relation of the public to dentistry, the relation of physicians to dentistry, and the relation of the law to dentistry.

The relation of dentists to dentistry is inexact, for each individual practitioner, according to the amount of culture and education possessed, and the circumstances surrounding him in practice, grades it differently,—all the way from what is high and comprehensive to

¹ Read before the Central Dental Association of Northern New Jersey, May 16, 1892.

² See the *Dental Practitioner*, vol. iii., No. 6, p. 132.

what is low and narrow,—expressing in teaching, in literature, in scientific society contact, both a manual and medical aspect, but carrying into every-day practice little else than routine manipulation. True dentistry, in the highest and only proper sense of that word, is to-day the broadest single branch of the healing art, and is capable of giving to the public a service as good and as valuable as is received in response to the majority of demands made upon physicians; but the public do not think of the services of the dentist in parallel lines with the services of the physician, either in appreciation or in the monetary acknowledgment they are willing to render for the same. They seldom approach him with other ideas of the scope of his powers than that he has the simple ability to fill a tooth, to extract a tooth, and to insert an artificial denture.

I do not propose, in speaking of the relation of physicians to dentistry, to revive here for one moment what I broadly discussed seven years ago. The years that have elapsed since then have been busy years, replete with many discussions and many conflicts of opinion, and the work has been thoroughly done, for we now propose to have a World's Columbian Dental Congress in 1893. No intelligent physician (M.D.) or dentist (D.D.S.) to-day thinks of dentistry as other than a profession. Each sees in his own domain an illimitable field of pathological study, sufficient for his desires and more than he can deal correctly with in a lifetime. The physician in particular knows that he peculiarly knows nothing of dentistry. That hazy blending of dentistry as a specialty in medicine is at last recognized to be a fiction indigenous to the minds of hybrids (M.D., D.D.S.).

The line of thought through which I have led you this evening shows dentistry to be in an anomalous position. Meaning as it does the care of the teeth, of the near and remote lesions having an influence on those organs, and of the medical and surgical aspects influencing them, it is recognized by physicians, who know that they understand but little, and that little indefinitely about it, to be in the hands of a class of men abundantly able to cope with every difficulty, and who are consecrated to a high professional attainment; but, nevertheless, it is so placed that we are unable to deal with a case eventuating in death (rare though it may be) with dignity and safety to ourselves and to our profession. Until the law, which causes dentists to qualify under a distinct degree, perfectly protects them in this direction, dentistry is without legal standing, and I fear that it will continue to give in large measure, and the public to expect, only a manual practice. May our study to-night lead to a more general adoption of more scientific methods of prac-

tice, and bring forth more scientific service, that these may help to secure for us a legal standing.

Recognizing that the thoughtful student always learns more by his failures than by his successes, I have chosen that we should consider the causes of failure in dental operations. Who is there who does not have failures? Who is there here to-night who has not time and again been humbled just as he was about to rejoice in the pride of his strength, and made to realize that he was not yet the perfect master of all things? In careers filled with successes we meet with failures, and a sufficient answer is constantly sought to the query, Wherefore?

Accepted methods of practice suggest that "failure in dental operations is mainly due to defective manipulation."

New departure practice says, "Failure of dental operations is mainly due to incompatibility of filling-material with tooth-bone."

And in 1887 your essayist offered the following sentiment: "Failure in operation and tooth-loss are mainly due to the lack of oral hygiene."

Certainly within the compass of these three replies is to be found much in explanation of the failures which occur; but my purpose to-night is to look somewhat back of these and at the more minute things which influence the results of our labors. Let us consider a few of those most prominent in my experience. In the first place, then, I am convinced that in filling teeth we often fail of success because we are not complete masters of the situation at the time of the operation.

The cavity to be filled should be so protected from dampness that perfect dryness may be assured at each succeeding step. Moisture threatening towards the close of an operation need not actually get into the cavity to influence deleteriously the future result. The hurried and worried efforts to reach completion dry, even though successful, are in themselves almost as sure a factor to produce future failure as would have been the moisture. We should also decline to operate when the space is insufficient through which to do the work. The fact that an appointment has been made, and that we expected, or the patient expected, the operation to be accomplished at that particular time, rarely should be reason sufficient for an attempt to render a service which we recognize as possible to be imperfect under the conditions.

I consider it essential in filling approximal cavities to invariably cut the enamel margins back sufficiently, that we may secure absolute metallic contacts only between the facing fillings, or between

the filling and the facing tooth, with the line of junction of filling-material and tooth-tissue so exposed as to be capable of thorough cleansing. Other conditions than this are to be considered a frequent cause of failure.

Up to this date proper sterilization of all cavities to be filled seems not to have been sufficiently insisted upon. We live in an age of antiseptics and germicides, and those who ignore their efficacy deprive themselves of agents of the utmost value. Scientific experiments of prominent investigators have shown that momentary application of these agents is but little better than no use of them at all. Proper sterilization of cavities requires the agent to be sealed in the cavity an ascertained length of time. To do this effectively most cavities will require preparation at one sitting and the insertion of the filling at another.

Now, gentlemen, I am well aware that proper space, proper control of conditions of moisture, and proper sterilization entails upon the operator labor for which he should be remunerated, and upon the patient consumption of time, for which he should be willing to give remuneration; and I know, too, that just here is the difficulty. The operator that conscientiously follows such high methods of scientific practice is, under the present status of dentistry, likely to find himself engaged in giving a service for which it will be difficult to obtain proper reward.

That difficulty would in large measure vanish if the profession as a profession would do its duty, and give a service in full accord with its knowledge. It would also lead to what to me is dearer than proper remuneration,—proper recognition in the thoughts of the public that dentistry is scientific in its methods of practice, and capable of something more than the scraping out of a little decay and the stuffing in of a little gold.

There is nothing more to be condemned than the putting on of rubber dam without prior medication around the necks of the teeth and of the adjacent gums upon which it impinges, and yet, collectively, we go on adjusting it day in and day out, smiling as we put it on, and pretending that the pain is but slight, building up in the minds of sensitive, shrinking patients a dread of us and of our methods. They are unscientific; and is it any wonder that we are not more cherished and more loved? That such are the facts of the practice of to-day is not the fault of scientific dentistry; it is the fault of its practitioners. There are means of relief that we know of, that we talk of, but which we do not use. I plead, therefore, to-night for the adoption of more scientific methods of practice. Thrust not

the lancet into quivering humanity without proper local anæsthesia, even though each cut is known to be the antiphlogistic touch of a therapeutic knife.

To reconstruct the position of dentistry with the public, we must adopt these scientific methods as a profession. One, two, three, or a dozen gentlemen cannot alone reverse the established title of error.

In my opinion the treatment of acute abscess should be relegated from the office to the patient's house, and regular visitations made by the dentist during the continuance of active inflammation. What science would there be in a physician allowing a patient with racked nerves, elevated temperature, and the whole ensemble of acute illness from abscesses in other portions of the economy to expose himself to the possible contingencies of weather, etc., by making visits to him at his office? Nothing scientific whatever, only malpractice. Is dentistry so empirical as to expect good results from such gross violation of the first principles of healing?

I have long believed that one of the chief causes of failure in dental operations is the fact that the dentist sees only a cavity to be filled, and that he responds to the only demand on the part of the patient, "I want a cavity filled." The plug goes into the cavity, and this is dentistry. More proper would it be for the patient to consult the dentist for professional advice. More proper for the dentist to examine the patient before doing anything or giving that advice. Inquiry into the physical condition of the patient at the time of the proposed operation, study of the temperament, character of tooth-tissue, environment, etc., should be the first essentials of the visits to the dentist, the filling of cavities a sequential matter only, and entirely subsequent. Each operation should be given its proper place in full compatibility with the essentials for success. The more tedious operations at the hours of the day when both operator and patient are at their physical best, and at no other time should they be done. With female patients, knowledge of their periods should be acquired, and dental operations suspended or reduced to a minimum during their continuance. I may be repeating to you here things with which you are all conversant, but it is because I believe the failure of many dental operations is due to the non-application in practice of the scientific knowledge which we have, and I desire to connect in your minds one with the other.

Most patients approach dental operations with dread; almost all suffer a nervous strain from even the slightest service. A better result is possible with a quiet and submissive patient than with a

restless one. This apprehensive and nervous condition of the patient increases with the return of each sitting during a line of work. The remembrances of what the patient has passed through during a given service is a deterring factor to a frequent and near visitation in the future for additional service or for examination. The nervous condition of the patient, therefore, is a factor in the results of dental operations, and far more successes and less failures would be met if the dentist would adopt proper medical systemic treatment before and after operations, and peculiarly is this true during the visits of protracted lines of work. Proper sedatives or tonics should be recommended before operation. Proper sedatives or tonics after operations. It may seem strange to you that I should say sedative or tonic, and yet it is true that you must determine in each patient which is indicated. It will not do for you to judge by the knowledge of temperaments which you may possess, or by the statements of the patients as to their nervous condition. You must in each instance scientifically determine it and the nature of it,—that is, whether the nervous anticipation stimulates or depresses the system; whether the nervous condition is anticipatory or most during the operation. For the purpose of determining these conditions, I propose the use of the clinical temperature thermometer. The following record of cases will illustrate my meaning:

Case.	Sex.	Temperament.	Age.	First temperature.	Second temperature.	Operation.
1	Female	Bilio-nervous.	40	98 $\frac{3}{4}$ °	99 $\frac{2}{3}$ °	Plastic guard.
2	Male.	Lymphatico-nervous.	19	98 $\frac{3}{4}$ °	99 $\frac{2}{3}$ °	Gold filling.
3	Female.	Nervous.	25	99 $\frac{2}{3}$ °	99 $\frac{4}{5}$ °	Alloy plug.
4	Female.	Nervous.	21	100 $\frac{1}{4}$ °	100 $\frac{1}{5}$ °	Arsenic application.
5	Female.	Nervo-bilious.	42	99 $\frac{2}{3}$ °	100 $\frac{1}{5}$ °	Filling ordinary.
6	Female.	Nervo-lymphatic.	30	97 $\frac{2}{3}$ °	99 $\frac{2}{3}$ °	Large contour filling, gold.
7	Female.	Bilious.	32	99 $\frac{3}{4}$ °	98 $\frac{4}{5}$ °	Alloy fillings.
8	Female.	Bilio-lymphatic.	30	99 $\frac{2}{3}$ °	99 $\frac{2}{3}$ °	Alloy and gold fillings.
9	Female.	Bilio-nervous.	30	99 $\frac{2}{3}$ °	99 $\frac{2}{3}$ °	Gutta-percha plug.
10	Female.	Bilio-nervous.	35	98 $\frac{3}{4}$ °	98 $\frac{4}{5}$ °	Gold fillings.
11	Female.	Lymphatic.	30	98 $\frac{3}{4}$ °	98 $\frac{4}{5}$ °	Gold fillings.
12	Female.	Nervous.	25	98 $\frac{3}{4}$ °	100 $\frac{1}{5}$ °	Alloy filling; no preparation.
13	Female.	Bilious.	21	98 $\frac{3}{4}$ °	97 $\frac{2}{3}$ °	Cleaning teeth; not scaling.
14	Male.	Bilio-lymphatic.	50	98 $\frac{3}{4}$ °	99 $\frac{2}{3}$ °	Arsenic application.
15	Female.	Nervous.	36	98 $\frac{3}{4}$ °	99 $\frac{2}{3}$ °	Examination.
16	Female.	Bilio-lymphatic.	37	99 $\frac{2}{3}$ °	99 $\frac{2}{3}$ °	Examination.
17	Female.	Nervo-bilious.	18	98 $\frac{3}{4}$ °	99 $\frac{2}{3}$ °	Gutta-percha filling.
18	Female.	Nervo-lymphatic.	28	98 $\frac{3}{4}$ °	99 $\frac{2}{3}$ °	Gold filling.
19	Male.	Bilio-lymphatic.	40	99 $\frac{1}{4}$ °	99 $\frac{2}{3}$ °	Plastic filling.

In an analysis of a table such as this there is much food for thought and study. A cursory review of it, however, shows that in some patients the elevation of temperature is greater before the operation than during it, that in the majority of cases the rise is during the operation rather than in anticipation of it. The depressed temperature in Cases 6 and 13 is suggestive of a possible condition in which a patient might die under gas extraction and the dentist receive the credit. Certainly those patients at the time were not in condition for the insertion of a large gold plug. The increase of temperature in anticipation, and a relapse towards normal during the operation, would indicate preparative system treatment rather than medication after the operation. But, gentlemen, I fear wearying you. The field of study is new, and there is an opportunity for you all to make records, and a subsequent contribution to dental literature. I hope that many will push the investigation with me, for I know that the more scientific our methods of practice become the sooner will dentistry have a legal standing accorded to it.

SOME FURTHER CONSIDERATIONS OF THE SUBJECT OF DENTITION.

BY C. N. PEIRCE, D.D.S.

AN editorial in the December INTERNATIONAL DENTAL JOURNAL can most assuredly be sustained and supplemented by every dental practitioner of twenty years' experience. In that period he must have had innumerable cases of trifacial disturbance which could have had, apparently, no other origin but tooth-development. How any one who has been for years in the general practice of medicine, with even a very limited experience in pediatrics, can for one moment doubt the disturbing influence of what is very properly termed "interrupted dentition" is a marvel to those who understand the origin and mode, or process, of development of the teeth and appreciate their physiological and pathological relations to the entire system.

That we have in this locality a degree of nervous endowment by or through the terminal distribution of the hypersensitive trifacial every anatomist attests, and that these terminæ are the seat of disordered sensibility and function from abnormal local, as well as systemic disturbances, every pathologist will also affirm.

To show the close relation existing between these parts, in their progressive developmental changes, and general systemic disturbances, we have to bring to mind the influence of disturbed nutrition upon the structures themselves. In the diseases of infancy and childhood, when severe and protracted, how unmistakably does the influence of disturbed nutrition, through imperfect calcification, draw its unfailing lines across the labial or buccal surfaces of the incisors, cuspids, bicuspid, or molars, the teeth so affected varying with the age at the time of the health-disturbance.

The genius presiding over the function of nutrition writes in such indelible characters that one who is at all familiar with the periods of calcification or progressive solidification of tooth-tissues, can with accuracy give the date of the beginning and the ending of the systemic derangement. The histologist, microscopist, and biologist, all unite in establishing the data of tooth-development, and give us the seventh week of intra uterine life, when the embryo is but little over an inch in length, as the time for the development of the enamel-germ or matrix, to be followed in the ninth week by the dentine-germ, these from that date progressing in their development until the seventeenth week, when the incisors and cuspids on the zonal- or border-line between these two germs receive depositions of the salts of lime. The odontoblasts on the upper border of the dentine germ are converted into dentine, while the lower ends of the enamel-cells, or ameloblasts,—adamantoblasts of Tomes,—are converted into enamel. By the end of the nineteenth week the same developmental processes have reached the molars, and from this period until the fortieth week, or birth, the integration and calcification of these deciduous tooth-germs progress simultaneously, so that at this period (birth) the eight incisors have their crowns quite complete, while the four cuspids and four first molars are fully one-half formed, and the four second molars about one-fourth or one-third calcified. Now, let us suppose that during the period of gestation the mother has been in a retrograde condition, so far as health is concerned, suffering, if you please, with phthisis, or any other constitutional condition interfering seriously with nutrition; what chance have these erupting, deciduous teeth for permanency or durability? Let us examine the child with such parentage at thirty months of age; what do we find? twenty teeth in position, with rarely more than two, and probably not any, well covered with enamel. If they are not defective on the cutting edges and masticating surfaces, the vertical surfaces will be pitted and broken, uncalcified or imperfectly calcified enamel-cells,

predisposing the teeth to dental decay and resulting in premature loss. And this from improper nutrition during embryonic life.

Let us now follow the life of the child with the influence of *its health* on the development of the permanent teeth. As early as the sixteenth week of intra-uterine life we have originating the enamel-germ of the four first permanent molars, and the twenty permanent teeth which are to succeed the twenty deciduous. These enamel-germs are quickly followed by preparation for the dentine-germs. Progressive developmental stages in all of these prepare them for the commencement of calcification by birth or shortly thereafter. By the end of the first year calcification has commenced and progressed to a greater or less extent in the four first molars and the four central incisors. During this period, and before it is sixteen months old, but beyond the eighth month, the child is suffering from what may very appropriately be termed interrupted dentition, to the extent of convulsions at intervals of days, or it may be weeks, but continuing in this enfeebled condition for four months or longer. What will be the condition of these eight permanent teeth when erupted? As they make their appearance through the gum, the horizontal or masticating surfaces of the molars and the cutting edges of the incisors will be imperfect in their enamel covering. Let us now suppose that tooth-development has progressed uninterruptedly until the child is five or five and a half years old, and it then becomes ill with scarlet-fever, diphtheria, or other serious disturbance,—by this time the second permanent molar has progressed from the period of its origin, three months after birth, until calcification has commenced at five years on its masticating surface,—where now does malnutrition write its history? On the crowns of the five anterior teeth, near the gum-line, or neck, and the masticating surfaces of the second permanent molars. If the systemic disturbance occurs still later in life, between the ages of eight years and twelve, then the crowns of the third molars, or wisdom-teeth, will in all probability show the result of malnutrition. Such is the history of systemic disturbances—improper or defective nutrition—upon the developing teeth.

If the teeth are responsive to the extent we have shown to systemic disturbances, it demonstrates most certainly a very close relationship with, and dependence upon, a normal arterial and nervous system. This relationship once established, it is certainly safe to assume that they, with their close connection with the terminal branches of the sensory, as well as the motor branches of the great

hypersensitive trigeminus, may play sad havoc with their manifold functions. The great argument against interference on behalf of tooth-eruption is that "dentition is a physiological process." Undoubtedly it is; but not more so than hundreds of other processes. Yet how often is the specialist, aurist, ophthalmologist, obstetrician, etc., called in to aid in what should be a normal physiological process?

But it is with facts we have to deal, and they are so numerous and well-authenticated that it ought to be supererogation to recite them, and it certainly would be if medical and dental practitioners would thoroughly inform themselves on the local causes or conditions which may induce these grave, sympathetic, nervous disturbances which interfere with the function of organs, near or remote. While it should not be held responsible for all abnormalities or pathological complications to which infancy, childhood, or youth are liable, yet, appreciating its possibilities, it is unsafe to ignore it while either deciduous or permanent tooth-development is in progress.

Purely normal dentition depends upon a complete correspondence between the development of tooth-germ and its calcification at its base, or growing extremity, and the absorption, or other wise removal of the overlying structures, so that, as the soft structures are solidified, the previously-formed and dense part of the tooth will be lifted from its base, and thus prevent impingement upon the uncalcified germ or dentine papilla. It is the backward pressure upon the uncalcified germ which produces constitutional disturbance. When this is indicated the lancet should be thoroughly used, that for the time the obstruction to the advancing crown may be entirely removed.

A few instances under the observation and treatment of the writer will suffice. Infants who for forty-eight hours or longer time have not had quiet sleep or retained food, have, on liberating the advancing tooth with the lancet, gone at once to sleep and remained for six or eight hours, with abatement of all unfavorable symptoms. Also those suffering from catarrh, with threatened pneumonia, have, with a similar operation, been entirely relieved. Boys of fourteen years of age affected by persistent gum over second permanent molar, and suffering from retention of deciduous molars, may be relieved by lancing the gum in the one case and removing the deciduous molars in the other. Also severe facial neuralgia from impacted cuspids and third molars has time and again been relieved by the removal of the offending tooth.

These few cases are abundantly sufficient to illustrate the susceptibility of the trigeminus to irritation with expressions in localities receiving the same, though quite remote from the cause, and also by the persistence of trouble to serious systemic or constitutional disturbances.

Reports of Society Meetings.

NEW YORK ODONTOLOGICAL SOCIETY.

A REGULAR meeting of the New York Odontological Society was held on Tuesday evening, November 15, 1892, at the New York Academy of Medicine, with the President, Dr. Woodward, in the chair.

Dr. Benjamin Lord read a paper entitled "A Brief Review."
(For Dr. Lord's paper, see p. 15.)

INCIDENTS OF OFFICE PRACTICE.

Dr. Osborn.—I hold in my hand two models, the teeth on which are retained in place by means of ordinary copper wire staples. They can be purchased for about twenty cents a pound at any hardware store, and it is almost impossible to break the teeth off, when they are used. They can be passed around for inspection.

Dr. Bödecker then read a paper entitled "The Doctrine of Inflammation."

(For Dr. Bödecker's paper, see page 1.)

DISCUSSION ON DR. BÖDECKER'S PAPER.

Dr. Heitzmann.—I can only be thankful to my friend, Dr. Bödecker, for what he said in his paper about my work. It is certainly remarkable that he scarcely spoke of his own work, and he did a great deal, I am sure, in the study of both the normal and the pathological conditions of the tissues of the teeth. He did not mention that it was himself, in 1878, who first described the reticulum in the dentine and the inflammation of this tissue, which is a rare disease; further, the normal structure of enamel, cementum, the pulp and the pericementum, and the inflammatory changes of all these tissues.

As for myself, I am ignored, forgotten, and abused,—ignored and forgotten in Europe, and abused in this country. The facts represented by Dr. Bödecker are substantiated by means of photography, independent of human eye or human hand. Even the reticulum I had the pleasure of showing to you last season is represented by means of photography. For the past two years a gentleman, Mr. Maximilian Toch, has worked in my laboratory. He is an expert in photography, and succeeds in producing this reticulum and its interconnections in all tissues. My assertion that the animal body is one continuous mass is now proved by him to be true for plants. We know that there are many plants that react upon the least irritation. If the *Mimosa pudica* is touched by a fly, the whole plant quivers as if convulsed. The doctrine of inflammation I tried to explain twenty years ago, and you have heard what the outcome was. It was ignored. In spite of having a bright and well-known teacher at my side (I refer to Professor S. Stricker), they ignore both of us.

Grawitz greatly surprised me with his assertions at the beginning of this year, where he describes the inflammatory process, and says that the intercellular substance furnishes even more cells than arise from the proliferation of the original or fixed tissue-cells. He bases his assertion upon his own researches as well as those of his pupils, and quite a number of articles have recently been published by him. The strangest thing is the work of Professor Weigert, in Frankfurt. He attacks Grawitz, and calls all his assertions nonsense. Weigert goes so far as to say that the intercellular substance is dead, and could not produce cells. He claims that the cellular pathology is a physical law that cannot be shaken, and this is said by a man who is a thorough adherent of Cohnheim's emigration-theory, who did his best to overthrow the cellular pathology by claiming that there exists no proliferation of the cells, but the image of proliferation is merely due to an emigration of colorless blood-corpuscles, or leucocytes. Is it possible that such things happen in Germany even in our day? I sent my book, with a short letter, to Professor Grawitz, and I had an answer from him in which he admits that he ignored everything I said twenty years ago. My book was published simultaneously in English and German, and the sale of it in Europe was so small that the publishers have reduced the price one-half. No one wants it; it is remarkable, indeed, that the English edition is almost gone, but the German was, financially at least, a failure. Grawitz writes me that in his next publication he will do me full justice.

I said I was abused in this country. I have opponents to my doctrine. This is well enough; every new doctrine has of necessity opponents. We know that an Austrian by the name of Auenbrugger, hundreds of years ago discovered the physical examination of the chest by percussion and auscultation, and said that every physician ought to know the process of making a correct diagnosis of diseases of the cavities of the chest. Woe to the physician to-day who does not know this method of examination. Much the same is my position. A man who discovers novel facts thoroughly contradictory to everything hitherto thought to be true, such as was the cellular pathology, who besides is a little over-enthusiastic, is invariably attacked. If the opponents were honest men and disproved what I said by earnest scientific work, I would not object; but unfortunately it is not so. The opponents use weapons which are not at my disposal, for my conviction is that in matters of this kind only absolute honesty will ever conquer. As long as dishonest means are resorted to for attacking such researches, I am without a weapon; I cannot fight them. I am told that our great bacteriologist, Professor Miller, of Berlin, recently issued a book in which he claims that myself and Dr. Bödecker make assertions regarding the structure of the teeth which no one has ever corroborated. I did not read the sentence, but if Miller said so, he is certainly much mistaken, and I am afraid the source is to be sought in New York. You all know that what I claim, I have demonstrated, and that it was by no means Bödecker alone who publicly announced his concurrence with my own views, but also such men as Frank Abbott, William H. Atkinson, John I. Hart, Roy, Davenport, and a man who never worked in my laboratory, Dr. McCausey, of Janesville, Wisconsin, all of whom have publicly announced that things are as I see them. Still, the assertion is made that it is only myself and Bödecker who make the claim.

But, gentlemen, one salvation exists for me and all my friends, and that is photography. Photo-micrography to-day has made such remarkable progress that we do not need a very expensive apparatus, such as the electric microscope, but an ordinary petroleum lamp is sufficient to produce all the details. Mr. Toeh, the gentleman whom I referred to before, is an amateur, and he leaves exposed for hours the plates on which he wants to photograph, to an ordinary photographic light, and the results are marvellous. The details come forth with a distinctness which leaves nothing to be desired. If photographs show all these minutiae, will there be

reason to doubt them? I hope not, for you know how photographs are produced. The plate is left exposed, and what the plate shows I believe to be true. What is before us? It is a fact that although we have worked hard for the past twenty years, we have received comparatively little acknowledgment for it, and that in Germany they have been just twenty years behind the times. Strange to say that those so-called learned men do not know the history of microscopy and histology, and come forth with discoveries that have been known to us in this country for the past eighteen years. I personally have grown old; my fanaticism is abated. I am still enthusiastic, but not as much so as formerly. I let things come as they will, because I am personally convinced that truth will always conquer, that honesty cannot die. I may die, but the time will come when my views will be victorious. In Germany they will claim that we are built up of individual cells, instead of one mass of living matter. As long as Virchow is at the head of pathological research in Germany, there is no hope for me; and still, if you ask whether I will continue my work, in spite of all these adversities, I say I will, up to the last breath, for I am sure the time will come when this work will be appreciated. It may be late, but the victory is surely ours.

Dr. Howe.—I move a vote of thanks to Dr. Bödecker for his able and interesting paper.

Carried.

Adjourned.

JOHN I. HART, D.D.S.,
Editor New York Odontological Society.

AMERICAN DENTAL ASSOCIATION.

(Continued from page 898.)

DISCUSSION ON DR. BARRETT'S PAPER.

Dr. Hunt.—I would like to inquire whether it is possible to distinguish which molar is in use in the living animal. I do not doubt but that the first, second, or possibly the third molar could be distinguished in size; but when you get to the fourth, fifth, or sixth, is it possible to know, except by an examination of the skull, and even then without going into the cribs which contain the germs of the later teeth?

Dr. Barrett.—A number of teeth are there and may still remain there. That, of course, can be determined, and if I should find a tooth with eight, nine, or ten plates, I should consider it a third molar.

Dr. Truman.—I was interested in the paper, but it does not afford food for discussion. It is a statement of absolute facts. There was one point that Dr. Barrett positively asserted, that I do not feel is absolutely determined, and that is in regard to the three anterior molars. He affirms that they are not deciduous. I think authorities are not in unison on that question. I should like to have it stated on what ground this is determined. I understand, of course, that they have no successors in the sense of premolars, but still they seem to me to have a deciduous character.

Dr. Thompson.—This paper is somewhat elementary, and there is nothing to which I could take exception, except one point with regard to the incisors of the rodents. I think the functional difference is very great. They are developed for different purposes. The incisor of the elephant is developed, as we know, for uprooting trees and plants for food, and for weapons in battle, and it would not be possible for them to be used for the reduction or mastication of food, whereas those of the rodents are made for cutting up food. In regard to these specimens, I think the abnormality is produced naturally by lack of wear, and that it has a relation to the selection of food. It seems to me the lack of wear has not disposed of the preceding teeth in time for the new production of the succeeding teeth, and the new tooth has begun to be produced before the old one is out of the way, and therefore it interferes with the production of the first and second teeth. It seems to me Dr. Barrett is wrong in regard to the excessive wear in captivity and the restriction of the animal to particular foods,—foods which it would not get in freedom. I judge that this is altogether due to the lack of use in captivity.

Dr. Peirce.—I have been interested in the paper very much, and interesting papers afford food for thought. I have no criticisms to make, but I want to add a word or two to what has been said. The matter that is of importance to us is the fact that the arrangement of these plates of enamel on the teeth of animals indicates the excursion of the jaw. It is interesting to show the correspondence with the habits of the animal. Wherever we have the plates standing as these do, at right angles to the body of the tooth, we must have an antero-posterior motion of the jaw. It is the adaptation of the parts to use. Moving the jaw backward and forward

brings these plates into their greatest use, while where we have the slight modification in the lower one of those two, there would be a slight excursion of the jaw. Where we have the plates standing in three different rows, we have not only an antero-posterior, but a lateral motion. The excursions of the jaw always correspond to the arrangement of the plates of enamel. It is a most beautiful adaptation of the parts to the use.

In regard to the case of Jumbo, I am inclined to coincide with Dr. Thompson that the second tooth commenced to form before the other had fully developed, and that caused an irregularity. The posterior part of the tooth is not formed at the time the anterior is. We have these plates added. So the want of room would have a tendency to throw this out. It would be interesting to know whether, with the arrangement of these plates in an irregular condition, Jumbo in using his teeth was known to modify at all the excursion of his jaws,—whether he had any other motion of the jaw than the normal.

Dr. Truman.—I would call Dr. Barrett's attention to the change in the form of the teeth from the mastodon to the elephant. It is an interesting fact that this was doubtless due to the change in the character of food from the period of the former, when this must have been coarse, as limbs of trees, to the finer grades in use by the modern proboscideum.

Dr. Barrett.—Dr. Truman says those teeth may be deciduous teeth. A deciduous tooth is one thrown off for the purpose of being succeeded by another. A deciduous tooth is one which belongs to an especially different dentition, and a different development of the teeth. For instance, in the diphyodonts we have different teeth. They are succeeded by teeth of another formation. In the elephant and all the proboscideæ there is no such succession of teeth. They are simply shed, the one shed being succeeded posteriorly by another. There is no formation; there is no advancement beneath the deciduous tooth of a permanent tooth, consequently they are all of the same character. They differ in size, but that is all. They are identical in structure, and I do not see that they can be considered as deciduous. If the first molar be deciduous, the second can be considered deciduous too, and so on. We know that the structure of the tooth is that of permanent teeth, and therefore we may consider them all as permanent teeth, for they all have the same characteristics, and must either be all permanent or all deciduous.

In answer to Dr. Thompson: The incisors of elephants, he says,

are not developed like those of the rodentia, and therefore would not be worn away, because the office is the same. That has nothing to do with it. The tooth being erupted, it may be put to any use. In all teeth of persistent pulps, whether of rodentia or proboscidiæ, the tooth will continue to grow and develop upon the line of the circle of its development, until it reaches its final size.

Regarding the wear of the teeth of Jumbo, I fully comprehend the weight of authority which may be against me, but I want to have my own opinion as far as I can. In its native state, the elephant lives upon succulent food; I mean that the green boughs will give much less attrition than the food of captivity. Consequently it must be the case that the wear of the teeth must be greater in the captive elephant than in its native state. Dr. Thompson, I think, said that the anterior plates were developed first. True. That sustains my position. The anterior plates in this case are very widely separated, unusually so. This would not be the case if it were due to pressure, which would tend to condense the plates. It is in the anterior plates that you find this wide separation of the enamel rings.

Did Jumbo have a different excursion of the jaw? I do not know, and we can hardly discover it; but I have examined the skull as perfectly as I could in the limited time I had, and as near as I could determine from the condyles of the jaw and the second bicuspids, it was no different from any other I ever saw. However, I cannot be positive. I hope to have the privilege of making sections of the jaw at some future time.

The evolution of the teeth from the mastodon to the elephant is the last point to which I wish to call your attention. I have here the teeth of a mastodon. Count the development of the tooth: the enamel covers the whole surface, but we have the dentine within the centre. In the course of development, by the wearing down of these eminences, what will be the shape and form of the enamel? Cut off the top of that until you reach the body of dentine, and you have the complete ring of the enamel that you find in the elephant. Separate the different denticles here, and they become dentinal plates, being worn down in the long process of development, and you have exactly the teeth of the elephant as they would be produced by the difference in the environments. Such a modification might be produced as will give the enamel this difference. In the body of the jaw the whole system is developed. We have an intermediate form in the diphyodonts.

Dr. Peirce.—Do you not recognize the fact that in the develop-

ment of these teeth, if this animal were subjected to the same friction, we would have the same tooth? These are softer on account of the difference in food. These depressions are quite filled with cementum, and it is worn out.

Dr. Barrett.—The tooth is not developed in that way. It is developed from the enamel eminences. I cannot speak authoritatively, because I do not know. I will never have the opportunity of examining the animal in its native state; it is almost extinct. There is no more trace of any connection of cementum than there is on the enamel of the condyles.

Dr. W. B. Ames, chairman of Section I., "Prosthetic Dentistry, Chemistry, and Metallurgy," then read his report, as follows:

"Section I. has had very little matter offered this year. We have no papers to report. With the indulgence of the Association, *Dr. George Evans* will describe a process of enamelling the surfaces of gold crowns. As he is not present just now, we will offer the other matter first, which properly comes under the head of chemistry,—a new oxyphosphate, the oxyphosphate of copper,—which I have personally brought out in the last year, and only offer it as a new thing, for what there may be in it, and I will pass samples of it about, so you may see what the nature of it is. It is a mixture of black oxide of copper and phosphoric acid. It is almost the same as oxide of zinc, except that the black oxide of zinc is used. In addition to this, we want to recommend that *Dr. Melotte*, of Ithaca, give a clinic demonstrating the use of a new fusible metal, which fuses at a lower heat than those now in use; also a method of getting an absolutely accurate bite for bridge-work. He is prepared to show this if an opportunity is offered. We also want to offer a resolution before the Association to the following effect:

"WHEREAS, Section I. has been unable, in recent years, to obtain sufficient matter to make a proper report; and

"WHEREAS, It is the opinion of the Section that it is properly entitled to papers on crown- and bridge-work, and orthodontia; therefore, be it

"Resolved, That hereafter all papers on that subject be submitted to Section I."

Report received and resolution adopted.

Dr. Low.—Before *Dr. Evans* speaks I would like to ask a question in regard to the oxide of copper. We have seen the specimens, and I would like to know what advantages there are over the oxide of zinc.

Dr. Ames.—This is something that I offer because it is new, and

possibly there is some value in it. The resulting compound is a very dense cement, and very hard. It seems to have a density and texture superior to any cement I have ever seen. Another advantage is that it can be used at a different consistency than other cements. Where we get best results from other cements in working by having them of a putty-like consistency, better results are obtained from this by using it in a fluid state. If it proves to have any permanency, which I think it has, the possibility of using it in this state is a decided advantage. It can be blown into a cavity, and allowed to become hard, and better results can be obtained from it. I have set crowns and bridges with it, and it allows of a crown or bridge being forced absolutely to its place.

Dr. Low.—How rapidly does it set, compared with the oxide of zinc?

Dr. Ames.—In the cold state it allows of considerable time for manipulation, but in the temperature of the mouth it crystallizes very rapidly, and must be worked quickly. There is a great difference in its qualities in winter and summer. I have found the cement prepared for winter to be hardly the proper thing for summer use.

Dr. Smith.—I would like to know if Dr. Ames has found it more irritant to the tissues than oxychloride.

Dr. Ames.—I think so. In some cases there was a marked irritation, and in others not.

Dr. Smith.—I have set crowns and bridges with it, and found it was quite irritating to the soft tissue, and it takes a much longer time to set. The great objection is its color. It is perfectly black, and produces discoloration. It has its use, however, as it becomes very dense and hard and insoluble. I am very glad to take the specimen, and I think it should have a place in our cabinets.

Dr. Evans.—In regard to the influence of heat in the mixing of cements,—the oxyphosphate of zinc and the cement presented by Dr. Ames,—it can be overcome in a very simple manner. Use as a slab for mixing a square 8-ounce bottle. Fill that with ice-water, and in the summer you will have about the same temperature to fix your cement with, on account of the cold given out by the ice, as you had in winter. In mixing oxyphosphate cement in winter, probably the cement will be at a temperature of about 65°. In summer, when it is 90°, there is a difference of about 35°, and the bottle is a very good thing to use. You can hold it in your left hand, and with the right mix the cement. I take an eight-ounce bottle, and place on one corner my acid, to the other side my pow-

der; in the centre, between the two, my bridge or crown. I leave those in position. I go to my patient, and prepare the mouth, fix the napkins, and dry the teeth; then I take my slab and mix the cement. I insert it in the crowns or bridge, and after seeing that everything is right in the patient's mouth, I take up what cement I need, fix it in the tooth or cavities, quickly pick up the bridge, adjust it in position, remove the napkin, occlude the teeth, and everything is well. If you are interrupted, you can even stop for a moment.

In regard to the other matter, I did not come here intending to present it to the Association, but there seems to be so much interest taken in it that I will attempt to describe the method.

A plan by which the labial surface of upper first and second bicuspid gold crowns can be finished or enamelled is most desirable. This process possesses the advantage of forming a strong facing, and one that firmly adheres to the metal. It is as follows: A gold crown should be constructed, of a high grade of gold plate, nearly or entirely destitute of copper alloy, or it should be made of gold and platina crown metal. After the crown is fitted to the natural tooth, the portion of the exposed labial surface to be enamelled is marked with a sharp instrument. The crown is removed, and the part within the mark thinned with a corundum-wheel, and then perforated at regular spaces. The crown is readjusted, and the portion to be enamelled bent with the burnisher anywhere against the surface of the natural tooth. The crown is then removed, and moistened glass enamel, which should be moistened with distilled water, placed over the indented surface in quantities sufficient to cover it. The crown is then placed in a muffle, made of thin platina. The inside is coated with whiting heated, and the surplus whiting brushed out, so there will be no adhesion of the gold to the platina. With a flame directed towards the closed end of the muffle, it is heated to a point sufficient to fuse the enamel. The crown is removed when cool, more enamel applied, and the crown again baked. Next, it is ground with a corundum-wheel, and the surface levelled, and flaws or pits opened up. These pits are then filled with the enamel, and the crown again baked. After this the enamel is ground to the level of the crown. The enamel and gold are then finished with sand-paper disks. A thin mixture of the enamel is applied with an artist's brush, and the final baking given, which should be at a high heat, as high as the gold of the crown will permit. The crown should be formed of gold alloyed only with platina, and then the heat can be raised to as high a temperature as will

melt pure gold, and you will not melt the crown. The open end of the muffle should be turned towards the operator, so he can see the exact amount of heat applied. I feel rather modest in presenting this to you, because I have not been able to give it a very great test, but from what I have seen of it, and from what the gentlemen who have examined it seem to think of the method, there may be considerable in it. I had Dr. Ames fracture the front of one of these models, to show how strong it is, and he says it is about as strong as a piece of porcelain enamel could be. Here is another model which is perfect. It is a little discolored, because there has been a great deal of solder placed in the crown. This one that was fractured by me was enamelled in twenty minutes at the Maryland State Society. In the mouth, the strength of the adhesion of the gold is very good. This piece is clinched on the inside. In the final operation of the enamel, I place with an artist's brush a little on the inside of the crown, so that it keeps firm. It leaves an additional amount of the enamel at the occluding surface, which forms quite a strong base for the piece of enamel which forms the front.

Dr. Thompson.—Does it keep its shade perfectly?

Dr. Evans.—I apply the enamel in successive layers. Each time I bake down and thoroughly fuse, at a very great heat. In the final one I give it a contour, grind it just as I want it, and then with an artist's brush I enamel over the surface, giving it a very fine coating, and then I give it the final baking at a high heat. The material I have used is that of Timme & Co. They have a variety of shades, and some directions in regard to producing different other shades, so you can get any color you like. This is less objectionable to many than gold, but I do not think it will be less objectionable than teeth which are filled with amalgam. People will tolerate a tooth in that condition where they would not a gold crown.

Dr. Patterson.—We have been looking for something of this character for some time. I would like to ask how the doctor controls the heat so as not to melt down the gold crown, and yet get it to the proper fusing-point. It seems to me to be rather difficult to withdraw the heat at the proper time without injuring the shell.

Dr. Evans.—That is very easily answered. I turn the open end of the muffle towards me, and direct the heat to the back of the muffle, so I can see my crown. It will be necessary for a person to make a crown or two to practise, and carry the heat to such a point that he will actually melt the crown, so he will know how high he can safely go. If you undertake to enamel one for a patient, the very first time you will probably melt it. You must practise

first. I protect it from the carbon of the flame. The one at the clinic was done with an ordinary lamp with an old-fashioned blow-pipe. I did not wish to put the gentlemen to any trouble, so I carried my lamp with me and did it there. With an alcohol-lamp there is less danger of carbonizing your enamel than with an ordinary blow-pipe. You must blow a strong blast so as to effect a perfect combustion of the carbon of the flame, otherwise you would very quickly carbonize the enamel and spoil it.

Dr. Peirce.—What preparation of platina would you use?

Dr. Evans.—From three to four per cent. of platina in pure gold.

Dr. Barrett.—Wherein does this differ from the process presented by Dr. Timme?

Dr. Evans.—I did not see his process, but Dr. Timme has been unable to produce any such result, and they have been very anxious to find out how I did it. Dr. Timme simply takes a crown which is alloyed considerably with copper, and, from what I have seen, he places it merely on the surface of the gold. That will chip off; it is not safe for the patient to have in the mouth, and there is no result in an artistic way. This is to overcome the objection there is to his method. The crown in this case is perforated, and my piece of enamel is anchored through the crown and fastened on the inside. I have not seen it before, and I do not think it has been published in any journal. The man who has presented a method almost similar to this is Professor Littig, of the New York College of Dentistry. It will be found in the reports of the New York Odontological Society. He removed the labial surface of the gold, placed a fine layer of platina, and then put on his glass material and baked it; the merit of my process is in its simplicity. There is no soldering to be done. I thin the gold instead of cutting it out, and then perforate it. He put his material on, and it was not anchored through the platina, and it was liable to chip off. He did not fuse it in the way I have done, in successive layers. My process is to anchor it through, fasten it on the inside, put it on in thin layers, and polish it just as you want, and not have it bulge out like Dr. Timme's. His stood out beyond the other teeth, like some crowns which stand out. The result is anything but artistic.

Dr. McKellops.—I saw this brought out at Berlin by Dr. Cohnheim, of Liverpool. He was doing enamelling work of this kind. He was putting it on plates, and I would like to ask Dr. Evans if this enamelling is a secret, or does he give the manner of making it.

Dr. Evans.—It is not my enamel; it is Timme & Co.'s. There is nothing secret about it.

Dr. McKellops.—I was in Berlin at the time, and Dr. Cohnheim gave a demonstration there of different plates. He gave different colors, put a gum color on, as it were, and he had several specimens. He put it on almost anything. What the stuff was made of I was unable to ascertain. He said he would give it to me, and I told him I was in the habit of going among the profession in this country, and that I had some experience in using enamel. I could not get the secret. He said it accomplished the same result on gold or platinum, or, in fact, anything else.

Dr. Evans.—If this is a question of priority or honor, I think we must go back farther than that; we must go back to our friend, Dr. Herbst, who visited us a few years ago. He introduced a method from which I got my idea of the muffle. He took glass buttons and various things, and formed these enamels. They are only compositions of glass. He took the steel thimble he had and produced the same result that I produced to-day. I am introducing it to you to advance the subject of prosthetic dentistry. It is all mechanical, and you may bring your results as you wish, and place them as you wish, but to Dr. Herbst belongs the honor of this little muffle, and a good many other things.

Dr. Guilford.—The credit of this kind of work belongs to Dr. Herbst, of Bremen. When his brother George was in this country, some eight or nine years ago, he exhibited to me a method of grinding or pulverizing crimson glass, and fusing it upon the neck of a tooth to imitate the gum color. He pulverized the glass to a fine powder, and used it on a tooth that was unusually long, and he did not care to have the whole of the white tooth show. After it was crowned, he moistened it with water, sprinkled the glass on it, put it in the muffle, and fused it on. He did not make a very fine color, but it was better than white. The different processes used to-day have originated from that method. They were nothing more than glass beads. You can buy them and pulverize them. Glass is more fusible than porcelain. It is not as strong, but you probably could not use porcelain on a gold crown. The reason this can be melted is simply because the gold is alloyed with a certain percentage of platinum. Gold fuses at a degree of two thousand.

In regard to the platinum crucible, I got the idea from Dr. Herbst. Any one can make it, if he wishes. Take a piece of thin platinum or iridium, having it the proper length; bend it over the finger and place the edges together; then put on a little gold, and you have a muffle that is entirely perfect. Where Dr. Evans lines his platinum muffle with a layer of whiting, I have

been in the habit of using a thin piece of asbestos-paper or felt. It prevents the contact with the gold, and gives you more general heat. One thing more I will mention in connection with the heating of muffles in that way. We all know that sometimes it is advisable to do a little soldering to a plain tooth, without taking the time to harden it. It can be done very readily, as, for instance, where we have a plate tooth and want to convert it into a tooth suitable for rubber work. It can be done by grinding the pin flat and laying the gold across it. Put it on the asbestos-paper, and slip it into the muffle, and it will heat at once. There is no danger of cracking the tooth, and, after you have heated it, just tip your muffle and let the tooth slide right out. I have done it repeatedly, and never cracked a tooth. It is a very ready way of uniting the pins of a tooth under different circumstances.

In regard to glass filling, which would come up here incidentally, I feel that many persons are interested in the matter. They promised a great deal in the beginning, but I do not think they have held out. A glass filling at best does not look very well. It looks better in the front of a tooth than a gold filling, but the difficulty of producing a proper shade, and of setting it in the tooth so the margins shall be good, is extremely difficult, if not impossible. It is better than nothing; but when we come to make a glass filling, building up the corner of a tooth, etc., we get on dangerous ground. I had a sad experience, and I think it is well to warn men in regard to them. They lack the quality of strength. In the centre or the face of a tooth no pressure is brought to bear, but on the corner of a tooth you will find they break. If they are placed, as Dr. Evans does his, in a muffle and melted down successively, you will get better results; but from the careless way in which it is sometimes done, you get only a weak mass, and if you place it where there is great strain, ten to one your operation will fail.

Dr. McKellops.—As far as enamelling is concerned, the originators of that method were watch-makers. That is where we get it. Subject and Section passed.

SECTION II.

Dr. Ottofy made a report, an abstract of which follows:

“It has been the custom of the Section annually to report the number of dental colleges in active operation in the United States. At the close of the last session the number was thirty-three, there having been no increase over the previous year. There have been established since last year the Dental Department of Tennessee

Medical College, at Knoxville, Tenn.; the Chicago Tooth-Saving Dental College, at Chicago, Ill.; the Dental Department of the Homœopathic College, at Cleveland, Ohio; the Dental Department of the Western Reserve University, at Cleveland, Ohio; and the Dental Department of the University at Buffalo, making an increase of five over the previous year. The total number now in operation is thirty-eight. The number of graduates in 1891 was twelve hundred and forty-one; in 1892 there were fourteen hundred and eighty-three. The average in the last seven years is nine hundred and four graduates per annum. The superfluity of many of these colleges was well demonstrated last year, when attention was called to the fact that it required the strength of fifteen colleges, more than one-third of the number, to graduate less than one hundred students; eight more turned out one hundred and fifty, while twelve colleges out of thirty-three graduated more than three-fourths of the entire number. We have here a tabulated statement of all the dental colleges. Two of the new colleges have held no commencement. It required this year the force of fourteen full-fledged colleges, with their equipments, Faculties, etc., supposed to be perfect, to graduate ninety-one students, an average of six and one-half each. In fact, eleven colleges together graduated fifty-one students. Who can estimate the terrible loss to the profession, were eleven colleges to be suddenly taken off the list? Eight hundred and fifty-one were passed from ten institutions, or a little more than one-quarter of the entire number of colleges graduating almost two-thirds of the list. The three years' college course does not seem to have had the ill effect so strenuously predicted. On the contrary, the number of students entering the colleges, though smaller, is superior. They fully appreciate the additional advantages gained. The number of years which a student should devote to dentistry will soon be placed at four years of nine months each. Any young man with a proper preliminary education will find that time sufficient to become proficient. There are now about one hundred and thirty local societies in the United States, with an aggregate membership of nearly five thousand.

"The Executive Committee has issued circulars to all the societies with a view of increasing delegate membership to this society. Two years ago twenty-two, and last year twenty-four, societies were represented in this Association. There are not as many this year.

"One of the important advances made in dental education during the year is the establishment of reading courses, somewhat after the Chicago idea, on the part of the Post-Graduate Dental Associa-

tion. It comprises several reading courses of from two to five years. No two are alike, and any one can profit by reading in several classes at the same time. The courses cover a wide range of reading, touching on the border-line of allied science. A certificate or degree will represent exactly what it says. None of these courses are to take the place of the college course, but are merely to supplement it, and to imbue the dentist with the scientific, literary, and artistic aspects of dentistry.

"Several additions have been made to the literature during the year. The periodical literature is far superior to that of a few years ago, and it is equal to that of the medical profession. There is to-day but very little copying done, most of the contributions being original. In the report of the Committee on Dental Science before the State Society, the following recommendation was made: 'That a good quarterly journal was needed, filled with nothing but original matter, edited by a competent dentist, and published by a house selling dental goods.' In addition to this, some one should start a weekly dental journal of sixteen to twenty-four pages, in a central location, so that dentists could be kept *au courant* with dental news. We think that it would pay. The weekly could be sold for three dollars per year, and if ten thousand subscribed, there would be a great awakening of interest.

"The following have been added to the literature:

"'Harris's Dictionary of Dental Science,' which is very valuable.

"A new edition of Sewell's 'Dental Surgery.'

"'Charts of Typical Forms of Constitutional Irregularities of the Teeth,' by Dr. Talbot, has been published; also a second edition of 'Descriptive Anatomy of the Human Teeth,' by Dr. Black.

"'Catching's Compendium' has also been published, and is very valuable when it is desired to find several articles on the same subject.

"The most recent contribution is the work on 'Dental Jurisprudence,' by Dr. Rehfuß.

"This concludes our report."

Dr. Hunt, of Iowa.—There is still another school that has issued a degree which is not mentioned in that list; it is in Alabama.

Dr. Patterson.—There is also one in Cincinnati.

Dr. Allport.—I do not wish to say anything against any reputable college, but it seems to me that what is termed "tooth-saving college" ought not to be dignified with a mention in this section. It should not go into our report, and I move that that part of the report be stricken out.

Motion seconded.

Dr. Peirce.—I hope it will not be stricken out. It is simply a record.

Dr. Truman.—I desire to endorse Dr. Allport's idea. I think it is wrong to have a name of that kind go out into the world in our reports. Many judge character from the stand-point of names, and this title "tooth-saving college" is certainly sufficient to condemn us.

Dr. Horton, of Cleveland.—This Society does not claim to endorse the reputation of any college or any institution. The chairman of the Section has given us the facts. I do not see that we render ourselves ridiculous by simply accepting the facts, without any endorsement. The fact is that such a college exists.

Dr. Ottofy.—I admit that I am ashamed to have been obliged to report such a college, but, as has been stated, it is a fact. It grants degrees, and there are sections of this country where the degrees are recognized. Many of the schools which are good to-day were, eight or ten years ago, just as bad as that one; consequently, this is a fact. The college is in existence.

ORGANIZATION OF SECTIONS.

Dr. Harlan.—The secretary is required at this time to read off the list of the Sections, and take the names of those members present who desire to join them, and I will now proceed to do so.

Adjourned.

Second Day.—Evening Session.

The meeting was called to order by the President, Dr. Walker. Dr. Shepard read the report of the Committee on the President's Address, an abstract of which is as follows:

"The committee to whom was referred the address beg to submit the following as their report:

"With reference to the suggestion relating to the World's Fair in 1893: Recognizing the importance of the Congress, and its joint parentage in the American and Southern Associations, as set forth in the address, we recommend that an appropriation of five hundred dollars be made from the funds of the society to the treasurer of the World's Columbian Dental Congress. In this connection we are pleased to state that at the recent meeting of the Southern Dental Association an appropriation was similarly made for the same purpose.

"DENTAL EDUCATION, LEGISLATION, AND THE DENTAL DEGREE.

"Your committee fully coincide with the sentiments of appreciation of and confidence in the work which is being done for the improvement of dental education by the Faculties of a good proportion of our colleges. The unification of State laws is very desirable. Efforts have long been made to secure the same in matters at the foundation of society, as marriage and divorce, and at the foundation of business, as in insolvency, with results that we need not dwell upon. We can hope and expect, through means within our own control, especially by the strengthening of the societies in each State, that each board will be of such knowledge and efficiency that a certificate of examination will be respected by the boards of other States, and either take the place of or modify the examinations. In most States the scope and thoroughness of an examination is entirely within the control of its board, the only obligation being that the board shall be satisfied that the candidate possesses the requisite knowledge and skill to meet the State's demand of safety to its citizens.

"In reference to the suggestion, 'That all States should be divided into districts, each having a board of examiners, and in the State board each district shall be represented by one examiner, and all boards so constituted shall be elected by the dentists of the State, and never appointed by the governor of the State,' we would answer: The question of the appointment to examining boards is surrounded with great difficulties. There is no justification for a board at all, except under the police powers of the State, and as safeguards for the health of the citizens. The members of boards are officers of the State, sworn to support it and faithfully perform their duties. Their power is derived from the State, and after appointment must be from the State, either directly or indirectly. There is no perfect government either in its plan or execution; every good citizen should aim to find out the best, and aid in the evolution of the perfect. The objection to an appointment by the governor is that he is not likely to know the most competent men, or will be swayed by politicians and political motives. Suppose in any State the State society embraces in its membership every reputable dentist, or even eighty per cent. of them. Would it not be feasible to get the consensus of the views of the members of the society as to the proper appointee, and by any suitable method recommend to the executive a candidate? Would not an intelligent governor welcome such a system and be glad to be thus relieved of

the responsibility, and would not a political governor realize the political power back of such petition, representing most of the dentists and their influence with their patients who are voters, and consider such an appeal to him as paramount to, or vastly greater politically than, any similar petition coming from any source whatever? In this way the objection to lodging the appointing power in the governor is greatly lessened, and, besides, presents a less complex system of securing a competent board than the one suggested.

"We respectfully submit that it is an ambition which all should share; that matters should be so managed in each State that the State society shall practically embrace the reputable profession in such State. This we regard as the principal factor in securing the best laws and their proper enforcement, the most competent board, and the much-desired interstate courtesy and recognition of State licenses.

"COMMITTEE ON STATE AND LOCAL ORGANIZATIONS.

"With reference to the formation of this committee as suggested by the president, your committee, realizing the benefit which the work of such a standing committee would be, not only to this Association, but to the whole dental profession, and coinciding with the spirit of the plan, offer the following resolution :

"*Resolved*, That a standing committee, to be styled the Committee on State and Local Organizations, and composed of three members, shall be appointed originally for terms of one, two, and three years respectively, and that all vacancies due to expiration of term shall thereafter be filled for a term of three years. All vacancies occurring from any other cause shall be filled for the unexpired term. The basis of the plan and scope of work of said committee and its duties with relation thereto shall be the suggestions as set forth in the address of the president of the American Dental Association for the year 1892, also the articles from which he quotes, and in harmony with the circular letters issued by the chairman of the Executive Committee.

"In regard to the meeting of the American Dental Association for 1893, we recommend the adoption of the following resolution :

"*Resolved*, That the annual meeting of this Association for the year 1893 be convened at the time and for the purpose suggested in the president's address, and that the consideration of the report of the special committee embodying certain proposed amendments to the constitution and by-laws be laid over for consideration at

that meeting. We recommend, also, that the matter of the death of Dr. John Allen, of New York, be referred to the Standing Committee on Necrology for proper action.

“ Respectfully submitted,

“ E. C. KIRK,

“ L. D. SHEPARD,

“ J. N. CROUSE,

“ *Committee.*”

Report received.

Dr. Truman requested the privilege of the floor for a few moments on a subject not strictly in connection with the business before the Association. This being granted, he remarked :

“ I have been impressed for a long time with the changing character of human life. The constant mutations are always a subject for thought, but as individuals grow in years, and the time comes for the closing of life's activities, we necessarily feel these more deeply if they be complicated with financial reverses. During the past few months one of the most distinguished members of our profession in the United States in past years, one who stood probably higher than any man in this room stands to-day, one who was looked up to by all, is now an inmate of a Masonic home in Philadelphia, and to-day some of us find it necessary to aid a fellow-member of this Association, one whom we have all honored, and whom I knew very well when I was but a stripling in the profession of dentistry. He has done more, perhaps, for its advancement than any man in the past, and probably more than any one now in this audience. I allude to Dr. W. H. Dwinelle, of New York City. The ‘ parting of the ways ’ has certainly come to that life ; he stands to-day with a clientele of exceptional character, and yet with present poverty staring him in the face. To-day Dr. Dwinelle has not one dollar to call his own. It does seem to me that when such a man, who has done so much for us, reaches this period, no matter what may have occasioned it, no matter that he may possibly have been improvident, we should do something in return. Dr. Dwinelle is at present living at his former home in Casanovia, under the care of a sister, and will remain there possibly until the final close of life comes to him, as it comes to all of us, sooner or later.

“ In view of this fact a few members of this Association have come together and appointed a committee to take charge of any fund that may be realized. A few in New York City raised a preliminary sum for his benefit. It is now proposed that two funds be

provided,—one to which any one may subscribe, to give a certain minimum sum, say five dollars yearly, or more if they see fit; and another in which they may, if they prefer, give any amount they please, and so finish up the matter, but preferably that they would give a certain sum every year. This will be placed in the hands of a committee which consists at present of Dr. Perry, of New York, Dr. Allport, of Chicago, and myself in Philadelphia, who will see that this is properly given to the recipient. All I want to do this evening is simply to call the facts to mind. Dr. Dwinelle is perfectly willing, after explanation, that this be done, and he would regard it as a testimonial to his honor, and to the work that he has accomplished. Therefore it is no degradation to him, and I feel it a pleasure as well as a duty to stand here in your presence and talk of this man whom I have respected all my life."

Dr. Allport.—I am very sorry that I have to give my services in this direction, but at the same time I shall be very happy to do anything I can for our old friend, Dr. Dwinelle. In regard to this matter, I was told what they had been doing in New York. I said, "I cannot consent to allow New York to do all there is to be done." He belongs to us all; he was not only a father to the younger, but also to the older practitioners in this country, and as our good friend Dr. Truman says, probably no one has done more than Dr. Dwinelle in his earlier days for the advancement of dentistry. I remember, when I commenced, that my preceptor used to take the old *American Journal of Dental Science*, and I never opened that journal without looking for the name of Dr. Dwinelle, of Casanovia. I felt that if his name appeared the article would be interesting. I was speaking to Dr. Morgan, and he mentioned a certain article; I remember the exact place I stood when reading it, in the little town where I then resided. I have never gotten over the impression it made upon me. Perhaps Dr. Dwinelle and Dr. Dunning, of New York, impressed me more strongly with a desire to succeed and make myself useful than any other two men who have ever lived. I remember distinctly an operation of Dr. Dunning, that has been before me for fifty years. I carry it in my memory as vividly as when I looked upon it, and I try to do as well as Dr. Dunning did. We are greatly indebted to Dr. Dwinelle, and it would be a shame to every man who has any means who is not willing to contribute his mite to help our good old friend in his trouble.

I was never impressed more with the importance of dentists taking care of their money than from what I heard to-day. Look

at Dr. Atkinson, at Dr. Maynard, at Dr. White, look at Dr. Dwinelle,—all men of eminence, men of great ability,—and see the condition they arrived at. Let me say one thing to you now,—take care of your money. Don't be mean or niggardly, but don't spend it without you get value for it. Don't squander it!

Dr. Morgan.—I had not intended to say anything to-night on this subject, but some of my friends insist upon my doing so. My early impressions of the character of Dr. Dwinelle are very vivid. When I first learned that there was such a journal as the old *American Journal*, as we call it now, I lived away in the backwoods, and had a preceptor who did not know there was a journal like that in the world until I stumbled upon the fact and wrote for the papers, and they sent them to me. I found the articles of Chapin A. Harris, and also articles signed "The Casanovia Editor," and without knowing who he was, and in my ignorance of the profession and of the qualifications often necessary for its successful pursuit, I began to read these articles, and they made a profound impression upon my mind. I learned to admire them for the clearness with which the author stated his propositions; for years afterwards I always hunted up his articles first. In speaking to Dr. Allport, I recalled to his mind an article that appeared in 1847, upon a subject of the treatment of teeth where there was deep decay, and I found a notice among my papers quoting what he said, what he did, the date on which he said it, and the fact that I proposed to follow his ideas. It was in April, 1847. I allude to that to show how his writings impressed me at the time. One of the best articles that journal ever had was the one I allude to. From then until the present time I have only lived to admire him and learn from him. His contributions have always been acceptable, and occasionally a patient of his fell into my hands, and I can say that the most beautiful operation I ever saw made by him with sponge gold was performed for Miss Nelson, a niece of the famous Nelson of the British navy, whose history you know.

Misfortune has overtaken our friend, as it is possible it may overtake any one of us. While he has made large amounts of money in fees in his life, in his old age he is poor, and I cannot see how any man, who has any humanity in him, does not have his heart go out in kindly feeling towards him. The highest attribute of humanity is the love of your fellow-men. It is perfectly natural for us to love those who are near to us, and it has been said that I love my family first and the dentists next, every one of them, without exception. I feel exceedingly kindly to this good man, who did

so much just at the time that dentistry was merging into a profession, for that was the first literature we had in this country that was worth anything. Through that, and out of that, has grown all that we have in the line of periodical literature, and none has been more useful to the profession. *The American Journal of Dental Science* had its origin when he was a member of the old American Society of Dental Surgeons, and afterwards passed into private hands. It ought to be our privilege to do something to mitigate the evils of poverty in this his old age, and thus allow him to gently pass towards the dark river. That period will come to us all some day, and in talking about it to-day, I looked around and remarked that this institution of which we are members is growing in years. Taft, Allport, and Morgan are all that are left who were here at the organization; McKellops was here when it was put on its feet, but he was not present at that meeting. Only one other man is now living whom I can call to mind, who was there, and that is Flagg. A few of us are not very useful any more. We may enjoy life as well as we ever did,—I hope every man in this audience does that,—but we have not much longer to be in this world, and if we have any of its goods, it is but rendering obedience to the principle of the Master, to the promptings of sanctified human nature, to reach out a helping hand to those who are in need, especially those of our own household, and I consider the dental profession part of my own household. Let us help our old friend in his last days, and relieve his mind of the anxiety that naturally preys upon it. You cannot spend the same amount of money in any other way that will bring you a larger reward. A wise man uses this world so as not to abuse it. No professional brother can use the same amount of money to better effect than to give it to Dr. Dwinelle.

The subject was then passed.

Dr. Smith then reported on behalf of the Committee on Credentials, giving the names of the different institutions from which delegates had been sent, in all numbering sixty-three.

The Auditing Committee requested further time for their report.

The secretary read a communication from Dr. Frank M. Odell, in which he states that he is unable to attend, and offers his resignation as a member.

Dr. Taft moved that the dues of Dr. Odell be returned to him. He is not present with us to receive any enjoyment from this meeting, and I think it but just that this should be done.

Adopted.

SECTION III.

OPERATIVE DENTISTRY.

Dr. McCandless, secretary of the Section, reported as follows:

"During the year closing July, 1892, there have appeared in the different journals about sixty articles, among them the following:

" 'Porcelain and Glass Inlays,' 'Extirpation of the Pulp,' 3; 'Treatment of the Pulp,' 4; 'Operative Dentistry,' 4; 'Capping Exposed Pulp,' 'Treatment of Pulpless Teeth,' 5; 'Relative Merits of Filling-Materials,' 4; 'Preparation of Cavities,' 'Art *versus* Nature, in the Form of Contour,' 'A Genesis of the Contour Filling,' 'Care of Children's Teeth,' 5; 'Vitreous Fillings,' 'Soft Gold-Foil as a Filling-Material,' 'Gutta-Percha,' 'Failure of Dental Operations,' 'Relative Advantages of Cohesive and Non-cohesive Gold,' 'The Cervical Border,' 2; 'Relative Conductivity of Heat by Filling Materials,' 2; 'Cocaine as an Agent in removing Pulp,' 'Care of Teeth during Pregnancy,' 'Value of Crystal Gold in Dentistry,' 'Inoculation from Unclean Instruments,' 2; 'Combination Fillings,' 6.

"I have in my possession the memoranda of all these papers, and if any one desires to see the same, I shall be pleased to give all information.

"One article only has been written on capping exposed pulps, while many of our classes at college took as a text for their theses 'The Treatment of Exposed Pulp.' At most conventions the essayists who dilated on this subject have invariably been young men in the profession and in the practice of dentistry, so that my observations differ materially from those of the gentleman who made a report of this Section a year ago. The older members have less and less to say each year on the subject.

"Dr. Conrad promised an article on the subject of filling teeth, but he is not present. Dr. McKellops can say something in this connection, as he has been heard to remark that a man could fill a tooth with gold better if he had more than one instrument to fill it with. Drs. Harlan and Crawford can also say something about this.

"This society was unfortunate last year in not having time to hear a paper on 'Art *versus* Nature,' and one by Dr. Crawford on 'Children's Teeth.' They appeared in the dental journals, however, and probably had a much wider circulation in that way.

"No new work has been published on operative dentistry this

year. The chairman of the Executive Committee, Dr. Crouse, has made a strong effort to bring the State and local societies into closer affiliation, and to that end he distributed circulars, requesting gentlemen to send him reports of the proceedings of their meetings, if there was anything of importance to the profession. To this he received twenty-five replies. In some instances, a fairly good synopsis of the proceedings was given, but in most of the cases the chairman failed to grasp the idea, and sent simply a list of papers read, with the names of the authors and the list of the officers elected. In reading over the various replies, I find little or nothing of interest. There is reason to hope that more thought will be given to this idea by the societies in the ensuing year.

"Dr. Ames has evolved the oxyphosphates of cement during the past year. One of the best cervical appliances is Dr. Gibbs's. He has given it additional strength by removing the front piece, and a firm spring holds the clamp in place until the thing is set. They can be had at any angle, to suit any case.

"A sand-paper disk-holder that cannot be improved upon has not been discovered. There are improvements in Johnston's cervix-clamp, Dr. Howe's heater for softening gutta-percha, and modifications of the Kells electric holder and improved root-pliers. Among the new devices are Bosworth's universal mallet, and the silver and platinum alloy screw-holders.

"Two papers have been prepared for this Section,—one on 'Transplantation,' by Dr. Morrison, of St. Louis, and one on 'Matrices,' by Dr. Cravens, of Indianapolis, Ind."

Report accepted.

Dr. Morrison, of St. Louis, Mo., then read a paper on "Transplantation," an abstract of which follows:

Of the cases reported in 1875 or 1876, very few are now to be seen. One of these cases, Mrs. B., was constitutionally the most unfavorable subject that could have been selected. While a majority of the others were favorable subjects, yet their teeth dropped out after a few years with their roots resorbed.

In many cases the sockets were not favorable to plant others, or the patients would not submit to the operation again. The manner in which these operations are regarded makes it exceedingly unpleasant for an individual who performs the operation. For example, a Mrs. H. B. had a left superior bicuspid implanted in November, 1887. Being the daughter of a physician, the matter was talked over from all stand-points, and she consulted the profession, both medical and dental, of this country and Europe, without get-

ting one good word in favor of such operations. On April 21, 1892, it was with difficulty that she was persuaded to have another implanted in its place, as one had already been in there. For two or three weeks she had all kinds of unfavorable symptoms. Erysipelas was threatened, and it was thought that she surely had that disease; then blood-poisoning, fever, loss of appetite, loss of sleep, etc., ensued. I was not alarmed at any time, but my patient and her husband and family were. I had seen similar symptoms with no bad result. Her physician was in my favor, and told me not to pay any attention to her complaints. He knew her disposition. If that patient had died, or become seriously ill from any other cause, I would have been held accountable to the law for performing an operation not endorsed by the profession.

Another case was that of Mr. E. C. K.; left superior second bicuspid. It was implanted in a socket. The face was much swollen at the time of the operation. Considerable pus oozed from the socket. The swelling continued for eight or ten days, and he complained of peculiar sensations under the eye and towards the ear. He made several visits to have it extracted. The patients seemed to be entirely unhappy with the teeth in the mouth for a day or two, and came from day to day to have them extracted, but I would not take them out.

Another case: A superior lateral incisor had been planted by a neighboring dentist, but he used a very dry specimen and drilled a large hole to fill the pulp-canal with gutta-percha, and the swelling of the gutta-percha by moisture, and the drilling, had caused about an eighth of an inch of the crown on the labial half to come away. The remaining stump and root were healthy. I adjusted a gold crown, which was worn but a short time when the rest of it broke down. I removed the remainder of the root and planted another dry tooth in its place, and the gentleman went away to an adjoining city. I supposed it was not successful, but he returned and I found that that tooth was doing very nicely, and in a perfectly good condition.

Mrs. McK. had two teeth implanted, the first bicuspid on each side, on May 31, 1888. The root became resorbed, and I had to implant another in April, 1892.

Mr. E. W., aged about thirty, had never erupted the left superior canine. For several years he had been waiting for it; finally it appeared, but only enough to be cut down, and extracted from a horizontal position in the mouth just inside of the bicuspids. The tooth was embedded in a horizontal position. It was a large,

well-formed tooth, except for a crack near the end. A deciduous canine was now extracted from its normal position in the jaw, the socket prepared, and the permanent canine that I took from the roof of the mouth was implanted in the position where the deciduous tooth was removed. It has grown perfectly attached to the socket.

Mrs. F. E. A. had a right superior first molar, three distinct roots, implanted November 2, 1891. Healed well and never gave a moment's uneasiness.

Miss C. had a lower incisor treated for months for catarrh. It was finally pronounced incurable, and was extracted, making the first space in the lower arch. As the patient was an artist, it annoyed her very much, and after three weeks she appealed to me for relief. I implanted another in its place. It was fairly firm.

To attend ordinary dental meetings and hear papers and discussions, one would think every operator would have no difficulty in preserving teeth by placing a small amount of gold in the tooth, and thus secure it for all time. From the mouths of the higher order of patients teeth are extracted, spaces are left vacant, or, worse still, ghastly porcelain counterfeits are placed in, which work mischief to the adjoining teeth. The slaughter-houses are not alone responsible for the toothless specimens too often seen. It has been my practice for years to transplant teeth to all sockets having good alveolar processes, where I remove a single root or two. With me the process is indispensable, and since Dr. Younger has given us the dry specimen, it is much more convenient, although the fresher the specimen, the better. Like a broken bone, security of position and absolute rest are essential. I use a copper wire ligature from the crowns of the adjoining teeth, under or over, as the case may be, and over the edge of the implanted tooth, also securing the ligature in position, and the interdental space, with phosphate cement, which is worn for six or eight weeks. This ligature is a very excellent thing. I rarely use silk or hemp. I formerly used platinum, or else rubber plates to be removed by the patient, but a neater process consists in making it of one piece of wire encircling the tooth, joining it on each side, and then twisted at the most convenient point, making a figure eight. Then join the free edges of the copper wire and the interdental space with phosphate cement, allowing the retention to be made perfectly secure while it is in that plastic condition.

Dr. Hunt then read the paper of Dr. Junius E. Cravens, who was unable to be present, entitled "Matrices."

It is a test of an operator's judgment sometimes to determine whether he shall use a matrix, or merely a support for his filling-material; there is a wide difference.

Webster's Dictionary says that a matrix is "a mould; the cavity in which anything is formed, and which gives it shape." If this definition is correct, not everything which dentists build gold against should be dignified as a matrix. A neighboring tooth often serves the purpose of a support, but who would regard a supporting tooth as a matrix?

A matrix for filling should offer certain advantages, such as thinness for economy of space, close conformity to cavity margins, however irregular, sufficient malleability to enable the operator to bend and dilate at any part and to any extent desirable; it should be cheap enough to be thrown away after once used.

Some proximal spaces are impossible, of course, but extensive preliminary wedging should never be necessary to adjustment of matrix or support; otherwise the device is too thick and badly designed, and the operator's judgment is at fault.

Some operators, perhaps many, use closely adapted matrices for gold filling in compound proximal cavities in bicuspid and molars, and it is not my purpose to criticise their methods, because of lack of sufficient opportunity for observing results; but criticisms have recently appeared in some of the dental journals, one writer going so far as to declare that perfect gold filling cannot be done in matrices. I think he is mistaken, for every cavity is a matrix so far as it affects the form of its contents; but from the few cases from the hands of others that it has been my privilege to observe, and a fair number of my own, I am satisfied that failures may easily be made, and that an operator's confidence in matrices sometimes is abused, because failures at obscure margins may not be discoverable until after the completion of the work.

The usual fault with matrix filling consists in imperfect adaptation of filling-material at cervical and lateral margins; for some operators to meet this objection may be easy, but there are those of us for whom it is not. Gold cannot always be depended upon for perfect adaptation at margins, unless in excess, and close matrices do not admit of excess.

By a support, as distinct from a matrix, is meant something that can be placed between two teeth, one or both of which may require filling, and serve to support the filling-material until secure, but without effect upon the contour. A supporter should also economize space between the teeth to the same degree as a matrix;

nothing more than the slightest primary wedging is really necessary for adjustment of a supporting device of proper thinness. A supporter should be of metal, very thin, springy, non-malleable, with no attempt at conformation to cavity margins; on the contrary, the margins should stand free, particularly in filling with gold, in order that an excess of that material may occur there for subsequent dressing down. Gold cannot always be depended upon for correct adaptation at margins unless in excess, and close matrices do not admit of excess there.

Perhaps there are operators who can secure exact marginal fullness with gold, no subsequent dressing or finishing being required, but most of us find it necessary always to dress away some at the margins for security.

PLASTICS.

In filling with amalgam or cement in compound cavities in bicusps and molars, matrices are advantageous; in fact, in any cases where contouring with plastics is intended; and reversing the rule for gold, the matrices for plastics ought to be closely adapted at all involved margins, and should mould the contour to any desired degree because the plastics are accommodating, and with careful manipulation a perfect cast of a matrix and approved marginal adaptation are attainable by all.

Matrices offering the advantages named in this paper may be constructed of German silver rolled to thirty-eight United States standard-wire gauge, a strip of which should be cut and fitted around the cervix of the tooth, and made to conform to the curves of the gum in the same manner as in fitting bands for gold crowns, etc., exercising care to avoid occlusion with teeth of the opposite jaw; a band should close with a lap-joint next to the cheek, and should be fastened with soft solder. In position, such a matrix may be dilated or bulged at any part, the metal yielding readily to moderately firm pressure, so as to conform to an approximating tooth or give fullness at any point.

Amalgam thus supported may with safety be permitted to stand several hours to acquire hardness, and often to accommodate the dentist's time demands. No wedging, no ribbon-saw, necessary, because the band has guaranteed enough space for finishing purposes, admitting the thinner strips and disks employed for that purpose.

In filling with gold in the same class of cavities, plain shields of the same thin German-silver will take and hold all the space re-

quired, and at the same time, if a little more space should be desirable for finishing purposes, it may easily be gained during the operation of filling by driving the gold firmly against the supporting shield, the gold actually wedging the teeth apart slightly.

I have made beautiful and durable contours with os artificial by use of the band matrix, a fact which is merely mentioned here to show the scope of utility of the band device. The German-silver band is easily constructed, easily adapted to margins, and made to mould any vertical contour, and is cheap enough to throw away after being once used.

To remove one of these band matrices the lap-joint should be opened, although it often may be done without.

(To be continued.)

ODONTOLOGICAL SOCIETY OF PENNSYLVANIA.

THE regular meeting was held November 13, 1892, at the rooms of the Society, 1228 Walnut Street, Philadelphia, Dr. Louis Jack presiding.

After the transaction of the usual routine business, the discussion of the evening took place on the question, "Should Examining Boards have the Power to grant Certificates to Undergraduates?"

The subject was opened by a paper from Dr. Jack.

(For Dr. Jack's paper, see page 10.)

Dr. Peirce.—I rather hesitate to express my views on this subject, as it is a matter of some delicacy, inasmuch as I am connected with a school, and it may be somewhat warped with my associations. There is one thing we need to remember, and that is, not to confuse incompetent Examining Boards with competent ones.

My views are that competent Examining Boards should be thoroughly prepared to examine and say whether the applicant is qualified to practise dentistry. If we have these, they are for the purpose of judging of the qualification of applicants. They have no right, in my estimation, appointed as they are by the Legislature, to ask the applicant whether he has a diploma, or where he got his education. All they want to do is to ascertain if the applicant is qualified to practise dentistry, and it matters not where that qualification is obtained so long as he possesses it. While I have that feeling, still I concur in the sentiments of the paper as to disqualification of applicants who have come up before the board; yet the

fact still remains that the law has no right to ask the question, where the information was gained. It is simply whether the information is possessed by the individual, and I would like our board so educated and so thoroughly appreciating their position that they should hold that ground, and not accept a diploma as a guarantee, and not accept anything but a thorough examination and satisfactory qualifications, and when we have that the public is protected, and we have an advance made in education.

I concur fully with the opinion expressed that applicants for examination are invariably disqualified. I have no hesitation in saying that, and that three years in college would not be too much instruction to require, but the fact still remains that the Legislature, in passing a law and the State in filling the Examining Boards should make those appointments with the view to the Examining Board being qualified, thoroughly qualified and conscientious, and if they were all like our president I should have no fear in the matter.

Dr. Kirk.—This is one of the subjects, I must confess, in which I have only a limited interest. This centres so much in other directions that I have not sufficient to go around.

If I understand correctly the statements made on this subject, that in the effort to obtain State legislation regulating the practice of dentistry, the committees have been met by the problem, the relation of State Examining Boards to college Faculties. The Constitution of the United States and the laws of the various States are repugnant to anything that looks like class legislation, and a law which would prohibit any man from practising dentistry, unless he was a regular graduate of a dental institution, would savor of that idea. Dr. Peirce has very clearly shown that when he states that such legislation would inhibit the class who wish to become self-educated. As a matter of principle, I don't see any objection to saying whether a man should not qualify himself to practise dentistry. The question is, Can he do it? It is the function of the State Examining Boards to answer that question.

I was on that board for two years, and had charge of the chemical and metallurgical examinations, and I know that the men who came up were absolutely unqualified in the most ordinary way, and certainly unfit to practise dentistry if they were to be gauged by that standard.

The State examination, if it is properly conducted, should be the barrier to the entrance of incompetent men into dentistry. Whether we should or should not examine men who have not

passed a college examination, it seems to me hinges on that point of the law in respect to class legislation.

Dr. Darby.—It seems to me the injury is to the student himself. It is not unusual for a man to enter college, and, after he has received a smattering of dental education, he concludes to continue the work at home. He practically says, I can work with my preceptor, act as an assistant, can study a little, and, putting what I have learned in college with what I can learn at home, I can manage to pass this Examining Board. He perhaps succeeds in this, and enters into practice, but he has not that broad culture, that many-sidedness that he would have had if he had remained two years more at college, so that injury reflects upon himself, and he is the sufferer.

Now, that is practically the main question. I was eight or ten years with the Examining Board, and among the applicants were men who had attended one course of lectures. They were, perhaps, well up in some of the branches, were really quite well qualified in operative dentistry, so far as answering questions. It was usually upon that branch that I examined, but they were not, and never would be by home study, what they would have been if they had attended one or two years more at college. So I believe the State Board, or the certificates granted, are an injury to the men themselves, and if we were to prevent that manner of granting certificates by State Boards, numbers of men would be better off in the end. Those who want to study and enter the profession will always find a way, and while it may seem almost impossible to raise the money, it can always be done if they are in earnest. Therefore I am opposed to the State Board.

Dr. Guilford.—The remarks of Dr. Peirce pleased me very much, and he covered, I think, the ground very thoroughly. This is an important question. As the law now stands in various States,—our own among the number,—the State Board is required to examine any applicant, and if he be found qualified to practise, they must give him a certificate to that effect. The question is, whether this shall be continued or whether the law should be changed. Dr. Jack has given several reasons why the law should be changed, and there is something to be said on both sides. The student, at present being required to take a three years' course before graduation, finds at the end of the second year, perhaps, his funds are exhausted, and he is not able to continue through the next course. The question, then, is, Shall he have the privilege of practising a while in order to raise funds to complete his education? The only way of doing that is to appear before the board and pass the exam-

ination. If he is prepared to pass, if he correctly answers the required number of questions, I cannot see why he should not be allowed to practise. The board stands as a guard to the public against incompetency. If the man is not competent, it is the duty of the board to find that out and reject him; but if they cannot reject him, certainly, I think, they must give him the certificate. I fail to see any fault to be found with that.

Another question is, Is it not true, or probable, that a student, after having attended two full courses in a reputable dental college, is better qualified to practise than many men who have passed the board in the past? If a student of that kind is qualified, and has been in attendance at two full courses of lectures, and passes the examination before the board, I cannot see why he should not be admitted to practice. I am willing, so far as I am concerned, that the law shall be changed in that respect. I fail to see any real objection to it.

As to Examining Boards, we have them of all sorts. That is proved by the fact that before certain boards it is almost impossible for any man to pass. Some of them have rejected men who were considered by the colleges very well qualified. That has happened time and again. On the other hand, students who have only attended a single course in college have passed the boards in other States. Two in our own college, and one the year before, went home at the end of the first course, and, desiring to practise during the summer, went before the State Board and passed the examination successfully. Now, that shows, I think, that the men who examined them were incompetent to do so, and it shows us also that there is the greatest degree of difference between the State Boards.

Now, another point, and that I think was in the mind of the essayist to-night, and that is that perhaps a student who had attended one or two courses of lectures and had appeared before a State Examining Board, and had passed that Board, would not complete his education in college. There is a probability of that taking place, but I have never known it to occur. In the cases under my observation they have simply passed the board for the purpose of practising a certain time, and then continued their course; so it has not acted injuriously in that respect.

It is very well for us to have laws regulating the practice of dentistry, but it seems to me we ought to go back of that and have something to say in relation to the composition of the boards,—what sort of men shall be in them, and what their proficiency shall be for examination, what the requirements shall be and the way of examining, and that it should be somewhat uniform and a method

of comparison between the boards. It seems to me that as it is now done it is very loose. The colleges make strict requirements, and more restrictions are being placed upon them each year, while with the Examining Boards there is no restriction.

There is another question, that of examining men who hold diplomas. That has hardly come up. The point I want to make is, in the first place, under the law as it now stands, different boards are required to examine any one who comes before them, and it seems to me it is not working any special harm. If a student is qualified to pass an examination, he will certainly inflict no injury upon the public.

Dr. Truman.—I find very little in this question. I have been astonished at the first and last speech. Here is a dean who is not satisfied with the teaching of his own school. He wants the diploma discredited by having the board re-examine the students. It is astonishing to me. I do not care to have any board examine a graduate of the University of Pennsylvania. I question their ability to do it. I am opposed to this granting of certificates, and I am surprised that my friend, Dr. Guilford, should defend a practice that will certainly end in discrediting dental education. It would be better to return to the old plan of every man studying in private and securing a certificate from his preceptor. The majority of boards may or may not be good.

This plan of granting certificates in some States has superseded the diploma. In a recent contest in New York State, in granting honorary degrees, it was asserted that a degree in New York State was superior to a diploma. If it has come to that, that a certificate issued by the State is superior to that granted by a college, we might with propriety give up all college instruction. A man can go to New York State and get his degree, and can then become a professor. And why not under the law? Is that an advance in education? I think not. I am opposed to the whole thing.

Dr. Peirce, in reply to Dr. Truman, said: The question under discussion is not whether incompetent boards should have the power to examine students. It is whether Examining Boards shall have power to grant certificates of qualification to undergraduates. We have to presume that the board has been legally appointed and has the qualification. We have to assume that in discussing the question. It is, simply, should Examining Boards have power to examine? If they have been appointed by the Legislature for the purpose of protecting the public, what else should they do? There is nothing else to say. They must have power to grant certificates,

or else they should not be appointed. It is not a discussion of whether they are qualified. I should say, with Dr. Truman, there was not a fourth of them qualified to grant certificates, but if they are selected, it is their function, and, having been appointed, they have that power.

Dr. Guilford.—I am afraid I didn't make myself entirely clear. I judge so from what Dr. Truman has said. He seemed to catch the idea that I was in favor of the old method of examining a lot of men,—anybody at all,—and passing a good many of them and allowing them to practise without a regular dental education at the colleges. My idea is that it would work no harm as things are now constituted. The Examining Board of to-day in the different States is very different from ten years ago. They have learned a great deal, and their examinations are of a very different character in many of the States. Now, if a student or any one else comes before an Examining Board, it is their duty to find out if he is qualified, and if not, to reject him, and that is the end of it. If he is qualified, I don't see how he can be prevented from practising. I think it is the reverse of preventing men from going to college.

In the early days persons who wanted to practise would appear before the Examining Board, and if not qualified they would be rejected, and they knew they could not possibly practise in the State; the only thing to do was to go to college, and this they did. Dr. Peirce will remember that was the regular course men took. They found they could not pass the Examining Boards and they qualified themselves properly in colleges, and I think that is exactly the effect it would have to-day, and I am sure the examinations are more stringent than they were then. I would not be in favor of men entering the profession outside of the schools; in fact, I am in favor of a law requiring them to pass through a school and obtain a diploma, but at the same time I see no harm in allowing students to pass between the courses.

Dr. Darby.—I think what Dr. Guilford has said is partly true and partly wrong. He says that men who pass the examination before the board do not come back to college. That very result, in my opinion, injures the man. If he succeeds in passing the Examining Board he goes into practice without that culture he would get from a second or third course in college, and for that reason I am opposed to it.

Dr. Jack.—I might state a subject that will be of interest. In the earlier days we experienced as a result of our work very considerable complaint in reference to the number of men who re-

ceived certificates of qualification from the board, and a resolution was passed at the State Association in which it was asked to appoint a committee for conference with the Board of Examiners to see if some means might not be devised by which a certificate of qualification would be made more difficult of attainment. After that two new members were put upon the board who were pledged to a strict examination, and when the board made up its organization the president announced that the incoming of the board meant a complete change in the policy of the board, and that certificates of qualification should not be granted unless they were most clearly deserved, and rules were adopted which made it very much more difficult to secure a certificate.¹

While I am on the floor, I might state that a few words are necessary on my part to clear up one part of the argument. It is certainly true that in all these twenty-eight States the boards are obliged to examine all who come before them. The question brought before us here is, though, Should the boards have that power? Should the law give that power to the boards? would possibly have been a better expression to have given the question. Should the law confer upon Boards of Examiners power to grant certificates without college qualification?

J. ATKINSON MCKEE, D.D.S.,
Editor Odontological Society of Pennsylvania.

CENTRAL DENTAL ASSOCIATION OF NORTHERN NEW JERSEY.

THE President announced that Dr. Faught's paper was now open for discussion.

(For Dr. Faught's paper, see page 21.)

Dr. Watkins.—I anticipate that we shall all profit by this essay. The causes of failure in dental operations are many. One of the most prominent is not being intimately connected with the medical profession. I believe that we would accomplish better results on those we operate if we were nearer the physician, and as a result would be able to do more scientific work.

I believe the profession has not the entire confidence of the

¹ From 1876 to 1885, inclusive, twenty certificates were granted by the Pennsylvania Board. From 1886 to 1892 two were granted. This difference indicates the advanced ideas of the board.

public. If we possessed that we would do more scientific work, and the results would be very much better. Consequently, it is the duty of the dentist to educate the public in his neighborhood in regard to the progress made in dentistry. Another way in which we frequently fail is in not having proper material to work with. Take, for instance, teeth that are of a soft, chalky nature, that crumble under the instrument. Ordinarily such teeth are filled with amalgam. Now, in my judgment, amalgam is a very poor material to use. The softer the tooth, the more is amalgam contraindicated. I believe if we were to use the tin or soft gold filling we would do much better. Amalgam will not save a tooth exposed to severe strain, for the amalgam is so much stronger than the tooth that it will outlast it, and the tooth will give way around the filling, whereas if it is a tin or gold filling it will not do so. If the filling is of a soft or somewhat yielding nature the tooth will be apt to last much longer.

Defective manipulation, as you all know, is another cause of failure. It means cutting away all frail walls, making them smooth; the proper disinfecting of the cavity, the proper manipulation of the material, and—not the least by any means—the thorough drying-out of all moisture,—these are the essentials of success. As the essayist has stated, it is not that moisture enters the cavity which is of importance, but the preventing it from remaining there while the filling-material is being inserted. The dentist should also be careful of his physical condition, for if he allows himself to become too tired, and consequently nervous, it is almost impossible for him to do good work. We frequently make mistakes also in not choosing our operations properly,—in not arranging our work and doing that which is the most severe and requires the greatest effort in the early part of the day.

Another reason why we fail, which seems to me of very great importance, is that we are apt to have too many irons in the fire. We should confine ourselves to our legitimate work.

I want to ask Dr. Faught when he closes this discussion to tell us how he would operate with the rubber dam.

Dr. Ottolengui.—Mr. President, I do not feel exactly like discussing the paper. I desire to commend the language with which the essayist has clothed his thoughts. I fear this is not attended to as it should be. It too often happens that the editor has to rewrite the papers that are sent to him. Now, it seems to me that those who write should have the elements of writing at their finger-tips.

Dr. Sanger.—The paper which we have had read before us to-night is one of very great interest. It is not a paper which you can discuss after a hearty dinner and do it justice. I have one or two things to say. The first is to thank Dr. Faught for his suggestion of putting ourselves into sympathy with our patients; it is a thought that we lose sight of very often. We deal with our patients as if they were so many customers to be furnished with so much merchandise. We forget the patient in the operation that lies before us. The mechanic comes to the front and the scientist takes the background. I think that this is one of the important factors in our failures. It is important for us not only to study the condition of the tooth, the material of which it is formed, and the vitality of the tissue, but also to study the patient himself, or herself, to learn for ourselves his or her temperament. I venture to state that if we will go over in our own minds the operations we have performed during the last week, and ask ourselves how many times we have looked our patient full in the face and considered whether they are nervous or phlegmatic, I think we will find we have neglected something in the operations performed.

Dr. Faught has brought before us a table giving statistics of the temperatures of his patients, and explained his thermometer for taking such temperatures. In this we are not scientific; we are merely mechanics. When we step out from our society we should take our science into every-day practice. If we will do this, it will not be necessary for us to educate the public through the newspapers and periodicals. There is no one better able to measure you than your patient; he will look upon you as either a friend or a foe. He will feel when you are in touch with him, and if you have his confidence you will be able to do more scientific work.

Dr. Luckey.—The answer to the subject of the paper, "Causes of Failure," might be a lack of thoroughness. If the operator is thoroughly prepared for his work, the patient is lost sight of in the operation, for the operator is so enthused or so in earnest that he forgets his subject, but this earnestness insures the success of the operation.

Dr. Bassett.—One portion of the paper conveys to me a new idea,—the taking of temperatures,—which Dr. Faught has reported, and which will, I think, explain a good deal that we have not before understood. I do not agree with the doctor in his idea of putting ourselves in sympathy with our patients. In fact, if we would forget the individual we might perhaps be capable of doing better work, but if we sympathize with him we are apt to become

nervous and in proportion lose our manipulative ability. I think Dr. Faught has covered the entire ground. Dr. Luckey has said that thoroughness is essential to success, and in that statement I quite agree.

Dr. Roberts.—I agree with the suggestion advanced by Dr. Faught in the taking of temperatures. When a patient comes into your office nervous and run down with pain, it is almost always necessary, in order to secure the best results, to put yourself in sympathy with him and allay his dread. The true scientific dentist, I take it, is he who can understand and see what is required to be performed.

Dr. Ottolengui.—Dr. Luckey did not quite take my idea. I did not mean that unless a man could write well, he must not write, but there is no reason why a man should not write grammatically.

As long as I am up I would say that there is one point that has been raised that has not been discussed, and that is in regard to the treatment of abscesses. It seems to me that it would be well for us to consider this question. The physician is lengthening his hours at his office more and more; the surgeon very rarely goes to the patient's house; all, or I might better say, a great many eminent surgeons, have places in which they can treat their cases. You can have no control of a patient while in his home. I saw an operation last week for removing abscesses, all of which work was done in the theatre of the hospital. The important operations nowadays are not performed at the house of the patient.

Dr. Boice.—The paper has not been discussed as to the point made by the essayist of the relation of the dentist to the medical profession. On that point I take issue with Dr. Faught and with his paper.

At the last meeting of dentists in Philadelphia it was suggested that they should have a surgical bureau where the services of a physician could be called for. The measure was referred to the Sanitary Committee, which consisted of five members. Because the physicians said dentistry was not a part of the profession of medicine, the measure was held for over twenty-four hours. The same subject was again brought up, and again defeated because they could not make up their minds whether the bill should read dentists and physicians or physicians and dentists, and it went back to the Sanitary Committee, and they never even read it. Three men agreed with the doctors that the fraternity did not accept the dentists as part of their profession.

In the census report the physicians did not want dentists to be

considered as part of the medical profession and registered as such. I think the fact is that dentistry is trying to become a profession. I have had some difficulty over the matter, but without much success. Of course, the dentist has a right to call for the services of a physician, and, if needed, upon a coroner, whichever is the most competent.

Dr. Faught.—I want to remark, in the first place, that once, while in the office of a celebrated physician, I saw him taking the temperatures of his patients; the thought then occurred to me why should not this practice be carried out in our profession. Since that time I have been careful to use the same caution, and have put on record in my paper the statistics of temperatures taken in a few cases, and now offer for your inspection the little instrument I use for that purpose.

In reply to Dr. Ottolengui with reference to the treatment of abscess at the house of the physician or in the hospitals, I believe that that is a custom which is coming into general practice not only in this State but in Pennsylvania as well. It also bears out my idea that dentistry cannot be carried on successfully entirely independent of medicine. I am sorry that Dr. Boice has had such an experience with physicians; he certainly has misunderstood the statement made in my paper. I did not say that the dental profession could not do without the services of the medical, but I do think that both professions would do better work were they to fraternize.

If you would commence in the morning by taking the temperatures of patients as they come in, you would be able to do far more satisfactory work. The statistics in the twenty-five cases I have given in my paper were of the temperatures of patients just as I took them coming in for a day or two.

To have a temperature just right is essential to the well-being of the patient. If the temperature falls below the normal, his condition is such as to preclude the possibility of doing effective work without danger; if a whole degree below normal, it may prove fatal. If you take a patient with a disturbed condition of the nervous system, who is generally "run down," and subject him to a severe operation, you do it at a risk; in fact, it is a wonder that more do not die in the chair. I do not think as many people are injured by the use of nitrous oxide as there are by being operated upon when in a low state of vitality. If dentists took the precaution to examine the condition of their patients, there would be less stigma thrown on the use of anæsthetics.

Dr. Watkins.—I asked Dr. Faught a question which he has not answered.

Dr. Faught.—I want to say to the doctor that if he will think for a moment he will recollect what I said on this subject. I did not come to put into that paper any particular method, because I use none; and, as I said in my talk, if we would be careful to find out the physical condition of our patients, we would be able to gain better results, and then we can begin to talk about methods of practice.

The President.—I wish to thank Dr. Faught personally for his paper, and also to tender him the thanks of the society.

Adjourned.

Editorial.

LET US REASON TOGETHER.

It is eminently proper at the beginning of a New Year to clear up the past and open a new account in the material things as well as in the moral and professional. This is the part of wisdom for all who desire orderly arrangement in the efforts to keep abreast with progress.

The year of 1893, it is anticipated, will comprise much within it for good or ill to dentistry. It is the year to celebrate the opening of the discovery of a new continent, and to the Columbian Exhibition all nations have been invited.

The celebration of the centennial of this republic did an enormous educational work. Never before were the people of the Old World so impressed with the developing power of the young nation as then. Never before had they appreciated the work accomplished, or did they come to understand the vast underlying possibilities in American life and energy. It did more than this, for it opened to the people who organized it the weak places in every branch of their own work. It changed, as never before, the thought and practice of a nation, and by its inspiring influence has the average intellectual force been increased and strengthened in those things that make for higher development.

That this is true all who take a broad view of this educational

period must acknowledge. It was more to American life than to those from whom that life originated.

If this view be accepted, how important must be the results of the present year! The vastness of the effort at Chicago almost paralyzes thought, yet mere size amounts to but little unless it combines with it the quality of superior excellence. It must show advancement. The people who come among us for the first time will expect to see the evidence of the active life of which they have heard so much, and those who are repeating the visit will expect to see evidence of growth. They will come here not to examine great collections, for America cannot hope to compete with those always existing in the Old World, but they do desire to examine the products of a younger civilization and learn the secret of that great prosperity, the origin of that wonderful inventive genius that has now for decades almost startled the world by its productive energy. If the Exhibition fails to meet this demand the country will be justly open to criticism that it has not kept pace with its previous record. This we know would not be true, and we believe that the Columbian Exhibition will demonstrate this as never before.

Dentistry was called upon to make its record there. The response from the organized associations was immediate and enthusiastic. The committees have been laboriously at work to carry out the wishes of those who placed them in these positions. The organization may be said to be finished. The officers have been selected, and now the completion of the work must devolve, in large degree, upon the profession as a whole.

In a former editorial we felt called upon to urge those who intended preparing papers to commence the work in earnest, and now we have a word for the lukewarm, the one who feels that he has not been recognized, or to him who may regard certain work as having been based on selfish motives.

Mistakes have been made, serious errors of judgment have been apparent, and many have been disappointed. Some have declared they would have no lot or part in it, and some have concluded that the World's Columbian Dental Congress could have no real scientific value. To these we have a word to say.

This hour is not one for personal bickering or the nursing of disappointed ambitions. It is the hour of self-abnegation for the good of the whole. It is strictly the devotional period, not in a religious sense, but in that sacrificing spirit that lays self on the altar built to commemorate professional progress.

Unity of thought, oneness of purpose, are essential, and we, therefore, deprecate anything that tends to diverse lines of action.

The World's Columbian Dental Congress is in the hands of the dentists of this country. They can make it more valuable than any previous convention if they so decide, but to do this there must be an untiring devotion to its interests. Activity is life, indifference means death, and we fear that the latter is the poison which may be doing more than open opposition. The past with its mistakes cannot be remedied, but the future can be so shaped by an energetic will that nothing will be desired to make the meeting a pronounced success.

Let all then come together with one purpose, and if criticism is to be made let it be reserved until the work has been accomplished and the end achieved.

FORCES WHICH MAKE FOR PROGRESS.

THE growth of civilization and the elevation of peoples in a moral and intellectual sense is an ever-instructive problem. Nations have moved in the circle of development from savagism to a higher cultivation, and returned again to nearly the first estate, apparently but little better for the civilizing gymnastics. The circle has been the favorite figure of many of the philosophers of the ages. It presents many discouraging features to the optimist who is unwilling to see anything in the future but an unending advancement to higher and still higher perfections. The scientific thought very naturally drifts into this conception, as any loss from a point gained seems an impossible idea, and yet the world cannot fail to remember its "lost arts" and past periods of active scientific development.

The forces that underlie progress are subtle in their character, but within certain limits are irresistible. The gentle zephyr becomes the cyclone. The slight shock of the Leyden jar indicates a dynamic force to influence a universe.

The lines of force in the physical run parallel with the moral and intellectual, while the circles are ever changing and the orbit of thought presenting new phases, the impetus given being ever onward to a more orderly sequence and larger development.

The contemplation of the last decade of the century, thought-engendered by the new year, carries us back, very naturally, to the

forces which have developed dentistry through its ten periods, each containing experiences of vital interest to the profession.

The dentistry of 1800 to 1810 was remarkable only for the fact that it exerted no perceptible influence for good or ill. The places where men labored as dental surgeons were practically shops, but they were building better than they knew, for the energy which was to travel through the century was even then silently at work.

Moving along decade by decade, the power widens and the environments improve, one period witnessing one advance and another still greater growth, one a period of college development, another of law, one great professional ability, and another enlarged theoretical acquirement. The force of intellectual progress has steadily advanced, few perceiving it, and to some it may be unintelligible, but it is ever making for a larger growth in the direction of a fuller professional life.

The world needs to be oftentimes reminded that the forces that make for progress are not impelled in one direction, but radiate everywhere, seemingly at times in diverse and antagonistic lines, yet the manifestations are ever tending to increasing mental power and professional strength. It is not alone in the classic shades that the world looks for its masters, but rather in the great active world, where frictional energy is being constantly developed, evolving new ideas, new relations, new activities.

He is most wise who can read the indications of accumulated power. Sooner or later this increase will result in the bursting of bonds, and revolutions will arise in the political, moral, religious, and even in the scientific world. When Wendell Phillips said, "Revolutions are not made, they come," he spoke a great truth. They are the accumulated force of long periods of apparent inertia.

The conservative, or not deep-thinking element in dentistry must certainly see that the close of the last decade of the century means the centralizing of all these periods of active thought, and the breaking away from the old, and with this change revolution of ideas will come. Selfish indulgence in ease, commercial alliances, want of professional enthusiasm, all must give place to a higher conception of duty than now exists.

The future of dentistry is yet an unsolved problem, but in whatever direction it may be led it will advance only in the broadest and best sense, by a close adherence to those laws which have developed individuals and nations, and in these are embodied the forces which increase moral and scientific power.

Bibliography.

DIE MIKROORGANISMEN DER MUNDHÖHLE. VON W. D. MILLER, Dr. Méd. et Phil., mit 134 Abbildungen im Texte und 18 Photogrammen. Leipzig Verlag von Georg Thieme, 1892.

This very much enlarged second German edition of Professor Miller's book is but another evidence of the universally recognized value of his investigations. That the first edition should have been exhausted, and require renewal in the comparatively short period of three years, seems to be exceptional for a purely scientific publication. The explanation will, doubtless, be found in the fact that the world-wide recognition of Professor Miller's original and exhaustive investigations has made the demand for anything he may produce coextensive with his reputation.

This book has reached somewhat formidable proportions, and the question may be asked, if the author be spared to continue his labor, where the limit will be found. It is certainly true that nothing he has published in the past can be omitted, and his very great faculty of condensing would seem to have made it impossible to go much farther in this direction.

In comparison with the first German edition, there is an increase in this of one hundred and forty-nine pages, and over the American eighty-four pages. The number of new sub-chapters are consequently extensive. Most of these have been made familiar to English readers through articles in the *Dental Cosmos*. Some are to be found in the American edition.

A careful examination of this work indicates the same scientific thoroughness as those preceding.

The chapter on "Asepsis and Antisepsis in Dentistry" is one of the recent additions, and in part published in the periodical named. It has not only a practical value, but should be carefully considered, not alone for the scientific facts contained, but as a warning to those who attempt to treat pathological conditions without proper training and knowledge of the possibilities underlying all careless handling of patients.

We have not the space to follow the author through the various means adopted to sterilize glasses, instruments, etc., and the relative merits of the various agents used for the purpose.

One of the greatest difficulties met with in daily practice is the sterilization of the mouth-mirror. This has necessarily to be used constantly, and it is very important that some plan should be devised that will affect the object without injury to the glass. The suggestion for this is as follows:

"For the satisfactory and certain sterilization of the mouth-mirror, it is necessary, after a preparatory cleansing with warm water, soap, and brush, to place it in strong carbolic acid from five to ten minutes. On removing it from the carbolic acid, wash in clean water or alcohol, and dry with a clean napkin."

In addition to the article on "Micro-Organisms of Dental Decay," in the American edition, there are some further investigations made in Professor Miller's laboratory by C. Jung. The latter examined seventy-two teeth, and succeeded in isolating ten distinct species, to which he gave the name caries bacteria, A to K. Four of these—A, C, E, and K—he found nearly always constant. He developed them in various culture media with the same results as had been obtained by Miller in previous investigations.

The new chapters, as well as the additional matter distributed throughout the volume, make this book of great value, and must increase, if that be possible, the already wide and deserved reputation of the author. It is to be hoped it will be followed by an American edition, so that it may be brought within the reach of all English readers.

A SERIES OF QUESTIONS AND ANSWERS FOR DENTAL STUDENTS, CONSISTING OF THREE PARTS. FRESHMAN, JUNIOR, AND SENIOR COURSE. By Ferdinand J. S. Gorgas, M.D., D.D.S. Snowden & Cowman, Publishers. Baltimore, 1892.

These "Questions and Answers" are divided, as stated, into three parts, of sixty, ninety-two, and eighty pages, for the use of students in each of the three years now required in dental colleges of this country.

They are intended to cover all the branches supposed to be taught in a well-regulated school. That they do this better than previous attempts in this direction must be conceded; but exactly why a professor in one of our foremost colleges should have deemed it necessary to elaborate these for the use of students is not so readily explained.

The process of cramming with bare facts has been carried to an extent both in dentistry and medicine beyond what would appear justifiable to those who value thoroughness and solidity of acquire-

ment. It is recognized that condensation in this form has a special value in some lines of work, but does not seem to be of general application. "Quiz" teaching has become an important part of the work in every well-ordered school, but this, to be of value, must not be confined to mere question and answer. The question should be the open door to the treasures beyond, and the intelligent teacher will make it the text for copious illustration of facts and principles, and in this way it becomes to the student an education. This is not possible in book-form, hence the belief that such works are not conducive to higher training.

Credit must be given to the author for covering a large field with marked ability. He has endeavored to give what he supposes may be necessary for the classes in each year, and, while the arrangement will not meet the needs of all colleges, it is, nevertheless, more nearly correct than could have been supposed possible. The long experience of Professor Gorgas as a teacher has served him well in this direction.

The failure to make a subject clear is nowhere more apparent than in the treatment of inflammation, the very foundation of pathological knowledge. He devotes nine questions to this in the first part, and it is quite certain the student will know nothing of the subject when he has answered them, nor are there any additions in the two remaining numbers.

The books as arranged will find a greater value with State Boards of Examiners than they can possibly have as aids in college work.

LIPPINCOTT'S for January, 1893, opens the New Year with an exceptionally interesting number. The novel entitled "A Pacific Encounter," by Mary E. Stickney, carries the reader over to scenes on the Western coast.

A very entertaining article by Elisabeth Ballester Bates on "An Old-Time Philadelphian, Captain Charles Biddle," has a sufficiency of local flavor to find interest among the "good families" of that city.

A translation from the French of Emile Bergerat on "A Dictionary Session at the Academy" (The Immortals) is a fine piece of satire, peculiarly French in the treatment, but racy in the extreme.

"A Spanish Painter," by Colin Campbell Cooper, is a review of the work of Velasquez. In "War-Time," "Across Dug Gap," "Foils and Fencing," "An Actress and her Art," and the usual gossip of the month, complete the number.

In "Books of the Month" is a good word for our old friend and genial professor, Dr. J. E. Garretson, who, under the name of "John Darby" has entertained an ever widening circle with the philosophies of Plato, Epicurus, Spinoza, translating these into "Nineteenth Century Sense." The Messrs. Lippincott are about to bring these books out in a uniform set of six volumes.

ALL AROUND THE YEAR 1893, a new calendar, published by Lea & Shepard, Boston, Mass., is certainly the most beautiful and artistic of these productions it has been our pleasure to see. It opens month by month with illustrations of a very young gentleman who "would a-wooing go," but "herein there lieth a tale," which is best told by the examination which it would be well for any one wishing to make a really beautiful gift to purchase. The low price of fifty cents sent to the publisher will secure one.

Obituary.

DR. JOHN E. REGISTER.

DR. REGISTER died in Philadelphia on November 8, 1892, of tuberculosis of the bowels, aged forty-seven.

His death, though not wholly unexpected from his failing health, came to his friends with the feeling that his work, valuable as it had been in certain directions, was not completed. He had reached an age when the enlarged experience and deeper thought promised more valuable results.

His preparatory studies in his profession were made with his brother, Dr. H. C. Register, of Philadelphia, and he graduated at the Pennsylvania College of Dental Surgery, in the class of 1869. He was always a diligent student, and succeeded in securing a special recognition from the Faculty for ability as an operator. His labors in chemical and mechanical improvements continued to the day of his death, and these he freely gave to his profession. One of the last of his productions, perhaps the last, appeared in the October number of this journal, on "Gold added to Copper Alloy." His retiring disposition made him less prominent than he

should have been, but those who knew him best appreciated the modest worth of his character.

He began practice at Port Deposit, Maryland, but finally removed to Dover, Delaware.

His wife died five years ago, two daughters surviving them.

Current News.

RECENT PATENTS.

A LIST of recent patents, reported specially for the INTERNATIONAL DENTAL JOURNAL:

485,280. Amalgam for Dentists' Use. Gustav Juterbock, Berlin, Germany. Filed January 4, 1892.

485,383. Dental Chair. Samuel T. Henkle, Baltimore, Md., assignor to the Henkle Dental Chair Company, Chicago, Ill. Filed January 22, 1891.

485,609. Mouth-holding Apparatus for Dentists and Surgeons. Howard M. Casebeer, Lincoln, Neb. Filed March 18, 1892.

486,112. Dental Spacer. Nathaniel Kuns, Fairbury, Neb. Filed April 11, 1892.

Selections.

HYDRONAPHTHOL IN THE PROPHYLAXIS AND TREATMENT OF CHOLERA.

DR. D. D. STEWART, of Philadelphia, suggests hydronaphthol as both a preventive and as a remedy for the cholera, after several years' experience with this drug in intestinal affections of bacterial origin. A remedy to be directed with effect against the contagion of cholera should be a more or less ideal antiseptic; it should be but slightly soluble and decomposable, yet a germicide in aqueous solution, and both non-toxic and non-irritant in doses sufficient to produce a germicidal action. It occurred to the author that hy-

hydronaphthol would perhaps fulfil the desired indications. It has been found of signal service in intestinal affections, especially those of bacterial origin. It is related to phenol, being, like it, a benzol derivative; hence, presumably, cholera spirilla might also be vulnerable to it. It is but slightly soluble in aqueous solutions, is non-irritant and non-poisonous, and does not readily undergo decomposition; it would, therefore, be carried unchanged to the affected part of the bowel, even in moderate doses, without absorption occurring. To determine its actual value as an antiseptic and germicide in cholera, Dr. Ghrieskey, of the Laboratory of Hygiene, University of Pennsylvania, undertook some experiments as to its influence on pure cultures of comma-spirilla. It was found in a series of experiments that in solutions of a strength of one part hydronaphthol and seven thousand parts nutritive culture-medium, the drug proved distinctly antiseptic. It was also demonstrated that with a mixture of equal parts of a saturated aqueous solution of hydronaphthol and a bouillon-culture of this organism, the drug was germicidal within five minutes. Dr. Stewart thinks we are likely to have in it a medicament of extraordinary value, for it has been actually demonstrated beyond question that a proportion as high as one to seven thousand has an undoubted inhibiting effect on the development of the cholera-spirillum, and that a proportion of about one to two thousand exerted a prompt germicidal action. As one part to seven thousand equals about a grain to the pint, or to the avoirdupois pound, and as the contents of the small intestine, when the latter in its entire length is thoroughly distended, cannot amount to more than nine or ten pints, it would follow that, under any condition, but ten grains of hydronaphthol, if in solution, would be required to render the entire small intestine antiseptic against the comma-spirillum, preventing its development, while about forty grains, under similar conditions, would disinfect the intestine, promptly killing any spirilla present. Fortunately hydronaphthol is non-toxic in doses probably much larger than would be sufficient for the latter effect. In cases of simple diarrhœa, in dysentery, and in enteric fever, the author has frequently administered a half-drachm in the twenty-four hours, continuing this often for weeks, totally without effect other than beneficial, but he thinks it certain that doses much larger than these may be similarly used. As a prophylactic against cholera, when, from exposure, the disease seems imminent, hydronaphthol should be taken in doses of from eight to ten grains four times daily for three or four days.—*Medical News*, October 1, 1892.

THE International Dental Journal.

VOL. XIV.

FEBRUARY, 1893.

No. 2.

Original Communications.¹

CROWN- AND BRIDGE-WORK.²

BY DR. C. M. RICHMOND, NEW YORK.

(Continued from Vol. XIII., page 860.)

IN this article is given the first of a series on crowns. I have illustrated an instrument which I have devised for the purpose of cutting or enlarging the cavity in roots of teeth to receive a post or tube as may be desired. All pins and all tubes are made square and tapering, and with this instrument the canal can be cut to the size, so the pin or tube will fit into it and the corners will touch the tooth the entire depth of the canal. It will be seen that a pin or tube could be made to hold a crown without the aid of a band or cement, so perfect is it possible to fit by this method. I had this instrument mounted on a short cable, as it at once adjusts itself to the direction of the canal, and the disagreeable sensation produced by a rigid instrument is avoided. In making the square tapering pin, a piece of round wire of irido-platina is used. The end is first hammered nearly to a taper form, and by this method the wire becomes harder and stiffer than in any other way. It is now filed to a taper as nearly perfect as possible. I have not found square wire as hard and rigid

¹ The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

² Copyrighted, 1892, by Dr. C. M. Richmond.

as wire made this way. Tubes are made for the pin by cutting a piece of twenty-two-carat gold the proper taper, so that when it is rolled around the pin it will come together and lap slightly, and in rolling or bending the first angle is made with a pair of flat-nose parallel pliers, using a hammer to get the first bend at a perfect right angle the whole length of the gold strip. The tapering pin is now placed into the gold, and, holding it in position at the first angle with pliers, I bend the second angle, and so on until a square tapering tube is prepared, and one that nearly fits the pin it is made over. I wish to solder this tube where it laps, and to do this without the least solder flowing inside and so ruining it, I file the lapping surfaces down to a straight edge and also quite thin, as I cover this surface with another piece of gold, and so thicken and strengthen it in turn. A thin, flat piece of plate is taken as long and a trifle wider than the tube, and on it is placed a small piece of solder, and with the blow-pipe I blow this the entire length. The tube is placed with the side which is lapped and filed down on the surface of the plate where we have our solder. Gradually heat to the soldering-point, and have so much surface to solder on the filed surface of the tube that when this is done there is no solder to run into the tube, it being all used in soldering the tube and plate together. Half of the tubes I tried to make were ruined until I hit upon this method, and I have not made an imperfect one since this plan has been used, and have frequently had students who would make them and get them right the first time. I now place the pin in the tube, and try it until I find which way it fits best, as no two sides of a tapering pin made with a file are alike, and the pin must be put into the tube the way it was made to go, and the pin and tube must be marked with a file so as to be sure not to get it together wrong, as a pin made to go one way and then turned half around would not go into place when the crown is finished. After the tube is soldered, the pin is driven into it, and with the hammer is filled, driving it until it is perfect.

In Fig. 1 will be seen the pin-and-tube combination. I make and fit a gold-cap as in my band-crown, cutting a square hole in the centre or opposite the canal in the root, the cap is put on the root, and the tube is put through the hole previously cut, and is carried down to its place in the root. The two are now waxed together with hard wax and again tried on. In placing the tube in its proper position, I place the side previously marked towards the front or facial surface, as the mark will disappear in soldering the tube into the cap. After the tube and cap are as we wish to solder them, the cap is in-

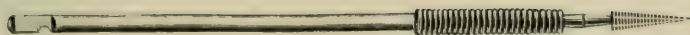


FIG. 1.



FIG. 2.



FIG. 3.

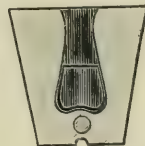
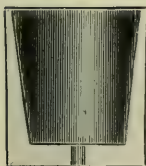


FIG. 4.



FIG. 5.



FIG. 8.



FIG. 9.



FIG. 10.



FIG. 6.



FIG. 7.



vested, and a small amount of investment is also placed into the mouth of the tube to prevent any solder creeping into it while soldering. After the tube and cap are soldered together, they are placed in acid until the investment is entirely cleaned out of the tube, which takes some time. The top of the tube is now filed down to the cap, as shown in the lower half of Fig. 1. The pin is now placed into the tube, and the marked side is placed towards the facial surface, as it was made to go.

A piece of gold is cut to just fit the half-cap, and a piece of gold bent (which is crescent-shaped) to go on to the palatal surface of the half-cap, as shown in Fig. 1. This is waxed together,—pin, half cap, and crescent band of gold,—and invested and soldered. We now have finished the crown or gold parts as shown in Fig. 1. I place this on the root, grind the tooth into its proper position, wax it on to the pin, and invest and solder as for any crown; and it is shown finished in Fig. 2. This is the crown I use in movable bridges, and, if it is properly made, it holds a bridge as firmly as a fixed piece. Care in all of the detail is required, as absolute perfection must be obtained or a failure is sure to result.

I show a system of constructing all gold crowns of one piece of metal, and not seamless.

Fig. 3 is a metal matrix and shell for holding the same. I use a steel plunger of the size of the entrance into the matrix. A piece of gold is cut large enough to go around the plunger, and is bent and soldered; I leave sufficient length of material to slit the top, and bend the pieces of gold over the end of the plunger, which makes a shapeless crown, like Fig. 4. This is now filled with dry marble-dust, placed in my matrix, put into the holding-shell, and with one blow from a hammer a crown is produced, which is a perfect *fac-simile* of any matrix which I use. The seams are now soldered, which stiffens the top and makes it very durable. After polishing, the seams are not perceptible, and the crown can be fitted to any case applicable. These dies will soon be in the market, and will fill a place in the laboratory as a time-saver.

Fig. 4 exhibits the shapeless crown, and Fig. 5 shows it after swaging with the marble-dust. These dies can be sold at fifty cents each; and all sizes and shapes of gold crowns can be produced in the laboratory for less than one dollar each, average cost.

Fig. 6 shows a crown, which I term V-shape. The roots are bevelled at the gum line, both at the facial and palatal edge; the canal is cut and enlarged as for any crown. A square tapering pin is fitted in the way described; a piece of pure gold thirty thick is

cut the size and shape of the end of the root; a hole is cut in the centre smaller than the pin, which is pushed with a pair of flat-nose pliers through the gold and into the root, the pin cutting its way through the gold as it is carried to its place in the canal. The pin now holds the gold in place, and with a burnisher of the right shape the gold is burnished on to the two bevelled surfaces of the root. The pin is now withdrawn, the gold being removed with it, and it is then invested and a small piece of solder placed on it, and the gold and pin soldered together. It is then cleaned with acid and placed again on the root, and the gold is again burnished perfectly to the root, and the edges, if they overlap, are carefully trimmed off. We now have a cap of gold perfectly fitting the end of the root, and a square pin fitting the root, as described. I place this in position on the root, and grind a plain plate tooth to fit the bevel while in the mouth. After doing this, the pin and cap are removed, and the tooth waxed on with hard wax. It is now tried on the root again and adjusted, then invested and the tooth soldered to the gold cap and pin. A small pellet of gutta-percha is warmed and flattened out very thin. A piece is cut the size of the end of the root, a hole made in the centre, and the piece slipped on to the pin up to the crown. It is then warmed in a spirit flame until sufficiently soft to adjust itself perfectly to the root. It is pressed home on the root while warm, and allowed to cool. It is then removed and the surplus trimmed off with a sharp knife after slightly heating the blade. The root is dried, and with a thin spatula some cement is carried to the end of the canal in the root, and a small amount of cement is placed on the pin and gradually carried to its place on the root. I consider this crown superior to all known methods of adjusting single crowns, and give it preference to the band-crown, as it is universal in its application, and will be a success where a band would not be tolerated. All temperaments will not act kindly to a band under the gum-tissues, while all can wear this style without trouble if they can endure anything on a root. The square and perfectly-fitting pin and the V-shape combination make it impossible to split the root or to turn on the root, while the joint is made impervious to moisture and is also absolutely cleanly.

In Fig. 7 I have illustrated the first of band-crowns demonstrated by myself in New York fifteen years ago, and called the screw crown. The crown is made like all band-crowns, with the exception of the post or pin. After the crown is ready to cement, a hole is cut through the palatal surface, and the bevelled screw-head is fitted

into it, with a small long burr made the same size and taper as the screw-head. After this is done, the nut or inside screw is adjusted by screwing the outer screw into it, the canal being previously prepared, the crown is tried on to the root, and if it lets the inside screw deep enough and the crown is in its proper position on the root, it is removed, and enough cement to fill the canal is mixed, and it is carried into place, and the crown again placed in position and the screw pressed down into the cement, which is allowed to thoroughly crystallize. The outer screw is unscrewed with a screw-driver, and the nut or minor screw is left embedded in the cement in the root. The root is dried again, and a small amount of cement is placed in the band of the crown, the screw started into the one in the root, the crown carried to its place, and the screw set up where it belongs with a screw-driver. The part of the screw that projects is polished off with a smoothing-stone and engine, and is finished. Should this crown need repairing at any time, the screw-head can be cut out and the crown removed easily, and by unscrewing the first screw a new one is used for resetting.

Fifteen years ago I set a crown like this at a clinic at S. S. White's Dental Depot. It is still perfect, showing the durability of this style of crowns.

Fig. 8 shows a band molar with a porcelain top. This band is made of gold- and platina-plate combined,—gold on one side and platina on the other,—for, as I wished to fuse porcelain into it, platina is required, as the heat sufficient to melt the tooth-substance would also melt the gold. After the band was fitted to the root, a piece of wax was placed inside the band crowded down to the root, to determine where to place a piece of platina to separate the root from the porcelain, and also to make the band strong by means of this centre piece. A model of investment was run into the band and into the wax which was placed there while the band was on the root. After removing the wax, I fitted a piece of the same metal, that the band was made of, inside of the band and down to the place the root came, indicated by the investment. This was then soldered, put into acid, and cleansed, and we had a band with a centre-piece soldered about midway of the same. I mixed some of the porcelain which is used in glass fillings, and filled up the crown part and carved into shape of a molar. This was placed on the fire and dried, and brought to the proper heat for the blow-pipe, which was now used, and the crown fused into the top of the band. As the first shrinks some, a second building is done, and after heating over a slow fire, the blow pipe is used to finish,

and a crown is produced which is preferable to all gold if it is to be placed in the mouth of one whose teeth are prominent while speaking or laughing. I make this crown and place it on the root at one sitting, or as quickly as an all-gold crown can be made and adjusted. It was first suggested by Dr. J. Bond Littig, of New York.

Fig. 9 shows a bicuspid crown, with band and pin combination. The tooth used in this operation is the countersunk style, with a pin baked in the space at the neck. In constructing this style of crown I first fit the band to the root, and, after selecting the tooth required, it is ground to fit inside of the projecting end of the gold band. This is done out of the mouth. After the band and tooth have been ground together, it is tried on the root and adjusted. A piece of pure gold is now cut to fit inside of the band, which goes over the root, making a hole for the pin. The piece of gold is worked down in contact with the tooth-substance, and it also fits the band and pin. The tooth is now invested tooth down, and the pin and band are exposed. I heat up to the proper point before using the blow-pipe, which is used in forcing enough solder into the band to attach pin, band, and all together. This makes a very artistic piece of work and strong as well.

Fig. 10 shows the oft-illustrated band-crown, and is constructed as before described.

(To be continued.)

NEW METHOD OF CLASPED PLATES *VERSUS* MOVABLE OR UNMOVABLE BRIDGE-WORK.¹

BY W. G. A. BONWILL.

TIME, with experience, levels all things. How one's practice will be changed if truth be uppermost!

I am surprised at the many summersaults I have made in nearly forty years. Because the Fathers said "*Don't*," I did as they bade me, and should yet, perhaps, if I had not been made of the material of which revolutionists come.

At one time I would not put in an upper plate without a suction, and never a lower one with a clasp.

For eight years gold and tin were used, but never amalgam.

¹ Read before the Odontological Society of Pennsylvania, June 7, 1890.

The uses of contour, at first, I did not see. Its beauties were more apparent when kept out of sight. Also artificial dentures and flat grinding-surfaces. All through my early practice I was afraid of offending the Fathers, and it caused me much sorrow and heart-ache and kept me in poverty and made me work harder than a galley-slave.

But live as long as you may, there are to be found many young as well as old persons who say "Stop" to every new advance. Do not mind them, but strike out boldly for yourselves and humanity.

In one thing I never have changed from the beginning of my career, and that is, never to sacrifice a tooth without a struggle for its existence. A human tooth has always been treasured as a physician would the living body, and with the experience gained and ingenuity in overcoming difficulties I seldom, to-day, extract a tooth.

In the effort to make all plates with suction I had an experience in the loss of a superior left lateral from bad dentistry during my first year of practice, giving me an opportunity to know personally why it could not be used in mastication. I tried in vain. On one occasion, instead of removing it as had been my custom at night, I kept it in, and had finished breakfast the next day before I discovered the fact. There had been accomplished with the plate that which I had never been able to do,—keep it in my mouth while eating. This was suggestive, and I applied it to others, and avoided clasping the teeth. In using only suction-plates I allowed many mouths, especially in the lower jaw, to go toothless, and yet, finally, a summersault was turned, and clasps are now used as a *sine qua non*. Adversity came still further to my aid, and it compelled me to use clasps and avoid bridging. The loss of a first inferior molar from too much cutting of bone material to gratify a great contourist, when a flat surface filling was indicated, and the "too much use of the electro-magnetic mallet" to gratify my vanity, destroyed it. I hammered the life out of it, and finally, as no one could relieve me, it was extracted. There was some immediate recompense, for it gave me an opportunity to try my own discovery,—"rapid breathing,"—and this proved an entire success. This loss was a most fortunate one for my patients, as it led me to adopt for them a plan which but for this I should never have thought of.

Up to this time I had persisted in refusing to use a clasp upon any tooth, and hundreds of cases in the lower jaw, and many in the upper, were allowed to go toothless because I could not put in

artificial teeth except by mutilation and permanent bridging, which I have never made in a single case.

All practitioners who were consulted in this case said nothing but bridging would answer. Necessity compelled a violation of a supposed law, and the result has been that in ten years I have been doing this class of work, no vacancy in the mouth having gone unchallenged. During all this time I had seen many cases of clasping good teeth, and the reason of decay and wear where the band was placed was apparent.

First. Any one who has any idea of pure mechanics in dentistry must admit that artificial dentures are placed in without any method, reflection, or planning,—certainly not as a mechanical or civil engineer would do in advance on paper,—and with no system to reach the greatest strength of plate and artistic appearance. It is astounding how persons ever get used to sets of teeth where no articulation has been given. True articulation is a sealed book to the majority.

Secondly. Bands are allowed to go too far up and under the gum-border. They are never wide enough. They have either too much spring or not enough for each individual case.

Thirdly. The clasp is allowed to move constantly up and down on the tooth until the tooth is worn very materially.

Fourthly. The clasp is soldered to the plate always in one spot,—on the anterior or distal surfaces of the tooth, just where most spring of clasp is needed.

Fifthly. The clasp has always been soldered on to the plate by fitting both to the plaster cast and soldering them immediately from that.

Sixthly. This plan of soldering never allows the plate to fit as it should, since the clasp draws the plate away from the tooth, and the tooth is forced out of its place and is never easy.

Seventhly. The value of the clasp is lost in not comprehending the exact relation it should bear to the plate.

Eighthly. While the clasp and plate may fit well, it is always a failure if the proper articulation is not in keeping with the opposing teeth. It causes all the strain to come upon the clasped teeth, when the plate should rest easily on the gum, and the clasp be firm yet not binding on the tooth.

Ninthly. The clasp made to fit too closely to every part of the surface of the tooth enveloped results in decay, from the fine capillary surfaces made by the too near contact of clasp and tooth.

Tenthly. From the imperfect soldering of plate and clasps the

bands have to be made to closely hug the surface; and, from the narrow necks of most teeth capable of being clasped, the plate is pushed too hard up against the gums, and to make the plate remain in the mouth the clasps are required to be stiffer and are never quite comfortable. There is not only wear, but caries is produced from the driving of the gum away from the cervix.

To add to this experience of clasping, there have been many failures from permanent and removable bridges. To grind off the entire enamel from any sound or partially sound tooth or teeth, to place over it a gold cap for one or many teeth, is the most unjustifiable of vandalisms. When I was told that the second bicuspid and second molar of the inferior jaw must be shaped to place over them caps of gold to insert a first molar tooth, I rebelled at once, as it appeared a sacrilege and a disgrace to our art.

Out of all the cases of bridging that have come to my notice, not one has been perfectly articulated. The surfaces of the bicuspids and molars have been ground flat, and, where cusps were placed on, when the jaw made a lateral movement, there was not a buccal cusp touched. The up-and-down movement alone was of any value. The cusps of gold were unsightly, and not the least art was manifest in the arrangement or in the selection of the teeth. The cement placed between the caps of gold and the tooth never fills up the space, being pushed out or away. Especially is this true of those cases where a part of the face of the natural tooth is shown from the cutting away of the gold cap.

The cement is put in so thin that it is sure to wash, or be dissolved by the powerful capillary force exerted by the oral fluids.

To add to this misery, the cervical border is seldom free from constant irritation. It is only necessary to allude to the stench arising from the accumulations upon the surface of the gold, like barnacles on a ship's bottom.

A bridge can not be kept any cleaner than a plate that is removable, and I never saw one of the latter that did not have to be polished out of the mouth with the same care as polishing silver-ware.

The dentist who will learn to place in partial and full upper or lower sets as they should and can be, and give no trouble to the wearer, will never resort to bridging except in very favorable cases, and not then by ever mutilating a good tooth-crown for a gold cap.

When a few teeth in the mouth are left without crowns, place on artificial crowns that can be clasped to hold the plate or plates in position without any fear of falling out. It is astonishing how

firmly one tooth, with a properly-fitting clasp, will hold a full set, upper or lower. I have repeatedly utilized an old root or roots with a porcelain crown, and, in time, should it be lost, the patient has become so accustomed to the plate that it is not missed.

Above all else, I assert, knowingly, that could the art of articulation have been carried out as I have demonstrated so often, bridging would never have come into such general use.

The objection to the system of bridging is that but few of even the best dentists are capable of performing the high class of work necessary to make it successful. It has been used in practice sufficiently long to show that there never was a more signal failure in any line of work, not even copper amalgam.

I have placed on many cases of bridging by the nut and bolt, a process by which the parts could be unscrewed and removed and repaired, and then the nut replaced, and be as tight as a piece of engineering.

When I advocated the cutting of the approximal surfaces of teeth to arrest or anticipate decay, a howl went up all over the land. Now that it is "the thing" to bridge, the same men that abused me for doing what I knew was correct have no conscience in regard to mutilating the enamel of any tooth to which they wish to attach a permanent band. Their gold caps glare in the light, and make vulgarity more pitiable and the dentist more contemptible. Teeth can be clasped, no matter how much they may be out of line or at an angle with the plate, and it will be seen that they will be of far more use and more artistic.

It is not necessary to fill the whole arch and palate with a plate, where a few teeth remain. A narrow, heavy plate, unyielding in character, will stay up just as well when confined alone to the alveolar border. Or where one, two, or three teeth in either jaw must be replaced, they will need but one full clasp and a very small plate to act as a saddle.

When the idea is once grasped of how a clasp should be fitted to a tooth without mutilating it, and how the clasp should be soldered to the plate, then dentists will see a new era dawning upon them.

Be it understood that I am not in opposition to all bridging, but only such as is done by those not familiar with mechanical work. It is then the human teeth have to pay the penalty for ignorance and false ideas of art. There is no occasion to ever deface a tooth, save to sometimes remove sharp angles to allow the clasp to be firm, which does no harm if the surface is polished again.

What can be done to obviate all this?

First, how should a clasp be fitted to the natural crown of a tooth to prevent future caries, and also prevent wear, and of what material and how heavy or light the metal, and how wide and at how many points upon the crown's surface should it touch to insure its steadfastness or security?

The thickness of metal is dependent upon the length of clasp, the width of same, and whether one or more clasps will be used to sustain the plate, or where there has to be very much spring to the clasp in passing over a crown that is very much out of perpendicular.

The metal should be of platinized gold only, without any lining of pure or twenty-two-karat gold soldered on it next to the crown. The metal should be loosely fitted to the crown on the plaster cast and afterwards fitted in the mouth directly upon the tooth and made to touch in at least four places. It should not be struck up to fit accurately every inequality of the surface, nor should pure gold first be fitted to the tooth by burnishing it on and then soldering that to the platinized gold.

If a clasp fits minutely all the surface of the crown, it makes of the minute space between the crown and clasp a capillary surface, and keeps the mucous secretions, as well as the fine food, forever in contact and with no space for circulation of the saliva. Whereas, if the band touches but a few places on the tooth-crown, it will rest just as firmly if it has been well fitted in the mouth and allowed to take its own position when tried upon the crown.

Capillary power made by surfaces very closely approximated is the surest means of producing caries. Where a space is left, the points that do touch are in absolute contact, and, aside from a slight wear on the tooth, the surface cannot decay as when there is an actual and close fitting. If made of fine soft gold, there would always be danger.

A clasp is not needed to grasp the crown very closely. The width of clasp should be as great as can be made, and to steady the plate without grasping it firmly. This will be a new idea to many.

Next to the clasp in importance is to know where it should be soldered to the plate, and on which side of the crown to allow it to go on and off, where the crown is very much out of perpendicular.

In this lies the principle part of the plan, and upon it depends entirely, or greatly, the success of the operation. The plate may

fit perfectly, and also the clasp, but all is vain unless the point is known where to unite the band and plate.

This cannot be done unless a plaster impression is taken of both the clasp and the plate in the mouth, so that the exact relation is obtained. The impression of plaster is now run with plaster and sand and the case soldered. To make the whole thing a perfect development the little gold angular tip must be soldered either to the clasp or the plate to keep the clasp from moving up and down.

It should be made of very heavy platinized gold and fitted to the top of the crown around which the clasp goes and upon that part of it that will be free from the antagonism of the opposite teeth. The side of the crown should be selected and marked by observations made in the mouth on the first visit. These can be fitted on the plaster cast.

When the impression in plaster has been taken of both clasps and plate, the easier plan will be to pour plaster and sand into it, and it is then exact, all ready for soldering.

Before any teeth are placed on it, by all means try it in the mouth to see if it will go in and out; for unless the impression has held all the pieces in exact apposition, the plate will not go in or be removed easily. A little filing may be needed to help in the adjusting. Frequently, where the tip rests on the grinding-surface of the crown, the latter has to be ground to let it rest firmly, which keeps the plate from anything more than resting in direct contact with the gum. This must be adjusted very accurately, and the plate will act as a saddle on the gum to prevent riding. This rest prevents any changes of position of the clasp on the tooth, and also any chafing on its surfaces. It is an absolute necessity. It is better it should be soldered to the plate than upon the clasp, as there will be more steadiness; but it must not interfere with the spring of the clasp. The drawings will show the best place for them on the tooth-crown. They should be very strong, as the whole force of mastication falls upon them. Use eighteen-karat solder for every attachment. These tips can rest on either a gold or amalgam filling, or the body of the tooth. If the latter, the enamel may be cut to prevent the antagonizing tooth from touching the tip.

Where there is decay upon the tooth to be clasped, I prefer to use amalgam containing much gold in it. There need be no fear of galvanic action or shock so long as the clasp is in direct contact with the amalgam.

My long experience with amalgam in these cases assures me that there is no action between these widely dissimilar metals to

deteriorate their qualities as preservers of tooth-substance, but the reverse; and the gold amalgam does not discolor to any extent.

I prefer to allow the edge of the filling to stand outside of the clasp and not rest underneath it at the top or next the grinding-surface, and I do not hesitate to use the corundum wheel upon the enamel where slight projections interfere with a clasp resting securely. No harm can result where the cut surface is polished. If caries should occur at any point thereafter from accumulation of food, I should fill with amalgam. But this need not often result when cleansed after each meal.

As I have already stated, the injury done to the tooth where a clasp is upon it is from the food being allowed to remain for weeks in contact,—never from the clasp where it touches, unless too accurately fitted.

Each case must be thoroughly studied after the plaster cast is made, or the result will not be satisfactory. The points on the clasp and plate where the bar is soldered to connect them *are the vital parts*, and, unless judiciously chosen and the bar made of platinized gold wire and the base plate of two pieces of gold soldered together to stiffen it, and the clasp of proper width and thickness, the strain placed upon the mechanism will break it. The bar holding the clasp and plate must always be upon the side of the tooth where there will be least resistance. Take a second inferior molar that has tipped forward very much and also inclines to the tongue. Here the soldering should be done as far back on the buccal side of the clasp as can be accomplished. Then the spring of the clasp is not needed for the buccal side, but for the anterior and lingual sides, where projecting from a perpendicular. If soldered from the lingual side, it would be impossible to get the clasp on or off.

In the upper cases it is generally the reverse, although there are many exceptions, and no rigid rules can be laid down. Each one must be specially studied, or no good results. Nor can you rely upon fitting plate and clasp to the plaster-cast and soldering from that,—no, never do it! Take the trouble to take impression of both plate and clasp in the mouth, and then solder from that.

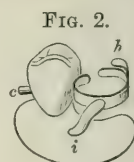
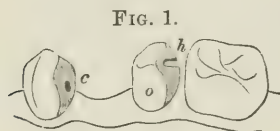
One of the greatest advantages, and one least likely to need repairing, is in the use of English crown-teeth used for rubber, or the tube-tooth for gold plate work. When vulcanized on, or soldered with backing, the grinding-surfaces are of porcelain, and are more artistic and sightly. Besides, if needing repair, it can readily be done. But when care is taken to make the plate heavy,

and a stiff bar is used to connect plate and clasp, repairs are seldom needed. I prefer the English tooth, where no soldering is needed to attach it to the plate.

Above all else, the operator is clear from such vandalism as is practised for permanent bridge-work, and has infinitely more pride in the result. Spaces can be filled with satisfaction to patients and for far less money, and the profits be none the less.

A study of the cuts will give an idea of this work, but it will not appear so clear until it is attempted. The articulation for one or two teeth I do directly in the mouth, but for three or more I prefer my articulator, and put on the minute details after the teeth have been attached.

The letters on each cut have reference to the same parts on all. Fig. 1 is a cast for first upper bicuspid, right side. A filling of gold was placed in the distal surface of the natural cuspid with a hole, *c*, drilled into it for the pin *c* in Fig. 2. The second bicuspid had



also a large amalgam filling, around which the clasp was placed, so that it would not show from the mouth. Fig. 2 gives the plate with English crown thereon, with pin soldered to the plate. The clasp has a tip at *h* soldered to it, and *i* is the heavy platinized gold bar, showing how it forms the attachment between plate and clasp, and just where; *c* is a pin, soldered directly to the plate, which enters the hole in the gold filling shown in Fig. 1.

Where no filling is in the cuspid I should use a short clasp fitted near the cervix, to reach from the palatal surface to the buccal, where it would not show from the outside, and soldered on the extreme palatal side to gain a spring.

Fig. 3 is the skeleton plate without the crown, which shows clearly the cast for which it was made. (See Fig. 5.) In Fig. 3 is *e*, the tip, resting on the second molar, soldered to the plate. On the plate next to the second bicuspid is soldered an upright with a tip, *e*, and a thin, narrow projection underneath it, which sets in a groove shown at *d* in Fig. 5, in an amalgam filling, to keep the anterior of plate in position and to prevent the plate from pressing too hard upon the gum; *i* is the bar

connecting plate and clasp on the lingual side. One or more pins for the crown can be used.

FIG. 3.



FIG. 4.

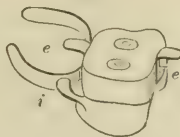


Fig. 4 shows the same with the crown cemented on with oxy-phosphate, or vulcanized, or with gutta-percha.

Fig. 5 is a case, left side, lower jaw.

FIG. 5.



FIG. 6.

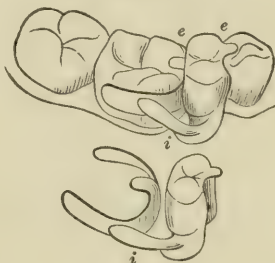


Fig. 6 is a second bicuspid tooth, right side, lower jaw. The bar *i* is soldered to the plate and clasp on the buccal side and the tip on the clasp on the first molar, and, as the crown is made entirely of gold, the tip is soldered directly to it to rest on the first bicuspid, and the anterior surface of the gold crown is made concave to fit into the distal surface of the first bicuspid, which prevents any movement laterally. A gold crown is used, as it is not seen, and facilitates greatly the soldering and adds immensely to the strength, and there is no danger of repairing in the future. The back tip, which rests on the molar, should have been soldered to the crown also, and less strain would come on the clasp.

Fig. 7 is an extreme case of tipping of the third molar, lower jaw, right side. The clasp was soldered to the plate on the buccal surface, and the plate at the second bicuspid was held as in Fig. 4. It could have been done by a narrow clasp to reach only partially around the second bicuspid, where it would not show on buccal side.

Fig. 8 is another extreme case where the second molar in the lower jaw projects towards the tongue and the second bicuspid towards the cheek. In this case the bar should be soldered on the

buccal of the molar near its distal proximal surface at *b*, and the second bicuspid on the lingual surface at *a*.

FIG. 7.

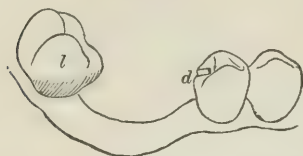


FIG. 8.



I cannot urge too strongly the retention of all roots that can be made healthy when no crowns can possibly be placed on them. When allowed to remain, and these plates fitted directly upon them, they become firm and non-irritant, and enable the same pressure to be used on the artificial teeth as on the natural ones, and are clean as any part of the mouth. I seldom remove a root that can be reclaimed. The satisfaction to the patient is immense. The retention of one tooth, either with natural crown or artificial, is enough to hold in position a full upper set with a plate very narrow and confined alone to the alveolar border, and with no suction, provided the articulation is perfect.

I can further assure the far more perfect success of these operations if the clasps are made to touch not more than at three or four points on the crown. Where fitted accurately, caries is doubly invited by capillary action.

Not least of all the virtues of this class of operations is that the average dentist in plate-work, or even the operator, can learn to successfully do it, when but few can pretend to do a respectable piece of bridging.

While it is so easily done if nice care be used, I do not wish to be understood that I would have any tooth extracted, knowing that it could be replaced so handily and to such perfect satisfaction to the patient.

I wish it further understood that the patients for whom I did these operations were not mine originally. I am thankful that from the very first of my career I have held the human tooth so sacred, and as years advance I am jealous of every root that can be at all utilized; and I believe I am clean in such matters, and keep my patients so, or I could not have laid claim to have extracted so few teeth from any cause. Whatever there may be about this method that is original, I freely tender it to the profession as not only worthy their serious attention, but free from any incumbrance.

CRYSTAL MAT GOLD.¹

BY EDWARD C. KIRK, D.D.S.

AT the last meeting I presented the result of an experiment in the use of crystal mat gold, for the reason that since I commenced the practice of dentistry I have experimented from time to time with various forms of sponge gold and have never attained results which were satisfactory until recently. I have taken it up and abandoned it again and again. I have given it limited use, but for such operations as I exhibited at the last meeting I have found it uniformly good. I brought the patient here, and exhibited the fillings, because, to me, they seemed satisfactory; and I asked at that time to have a committee appointed, so that I might have the benefit of their judgment whether they would be accepted as good operations in gold,—regardless of the kind of gold, but simply as gold fillings.

I now wish to state what I have to say in regard to the method which I employed in those operations.

The principal difficulties which I have heretofore experienced in the use of any of the well-known forms of sponge or crystal gold have been the inability to secure satisfactory margins, and the tendency which the material has of balling up, and so bridging unfilled spaces in the cavity, and at the same time producing an unevenness of surface to the gold plug which it is difficult to counteract. Heretofore the amount of delicate manipulation and careful work necessary to insert a filling of sponge gold which would compare favorably with fillings of foil has been so great that the amount of time consumed in making such a filling constituted the greatest obstacle in its employment. There seems to be no doubt that a filling can be made of sponge gold which answers all the requirements of a perfect filling as satisfactorily as one made of foil, but for the reasons noted, and under former conditions, it seemed to bear no comparison to gold-foil in ease of manipulation and the consequent amount of time necessary for its insertion. Some experiments recently undertaken, with the view of determining the adaptability and comparative working-qualities of the form of sponge gold known as crystal mat, have brought out certain new data with regard

¹ Read at a meeting of the Odontological Society of Pennsylvania, December 10, 1892.

to the working-qualities of this kind of gold which lead me to believe that when its manipulation is properly understood and definitely carried out in harmony with certain principles, its introduction can be accomplished with a degree of certainty, ease, and rapidity equalling, if not surpassing, that of foil and its various preparations. First, with regard to the marginal preparation of cavities. In order to insure the best results with crystal mat the margins of cavities must be strong, and formed with a bevel. They must present a square shoulder, so that when the gold is finally finished it will be butted up against the margin without any overlap. Where a bevel is used I have found it next to impossible to prevent the wedge-shaped edge of gold which forms the slight overhang at the bevelled margin from breaking in finishing, but if the margins are made square-shouldered, as stated, this does not occur, and the joint can be made absolutely perfect with ordinary care. The use of sponge gold in starting fillings by filling undercuts or retaining-points is well known, and its use for this purpose has gained wide acceptance by the best operators. It is therefore not necessary to comment upon the value of this kind of material for that purpose. In the filling of the body of the cavity, after the anchorages are disposed of, I have found the best results to follow the method which I shall now describe. A pellet of crystal mat gold approximating the size and shape of the floor of the cavity should be selected, and, after annealing, carefully placed in position, so that it well covers the floor and is in contact with the anchorages, care being taken to introduce it with as little compression as possible. A plugger point with shallow serrations is then used to tack it to the anchorages, after which a broad-faced foot-plugger, serrated in but one direction preferably, is used to compress the pellet into place by hand-pressure. When it has been firmly condensed by hand-pressure it should be malleted into a uniformly homogeneous mass.

A number of operators have expressed the opinion that crystal gold should not be densely malleted, claiming that better results are obtained by the use of a light mallet-blow, or by hand-pressure. My experience leads me to take exception to this. I know of no form of gold that will endure the amount of malleting which crystal mat will. It becomes denser and more homogeneous by hard malleting than any form of gold with which I am acquainted. This seems to be born out by a study of the physical make-up of crystal mat gold as compared with foil. In the use of foil the amount of force necessary to bring about perfect cohesion of superimposed laminæ is inconsiderable. This is shown by the ease with which

solid plugs can be made of foil by hand-pressure or by the rotation method; but with crystal mat, or any form of sponge gold, continuous and evenly-applied malleting is necessary to bring into perfect cohesion the minute particles of gold which constitute its make-up. The malleting must proceed in every direction, in order that the plug shall be of uniform density and of perfect cohesion throughout, a result which cannot be accomplished by ordinary hand-pressure. The principle which should govern in the condensation of crystal mat gold is to first bring about a moderate cohesion of its particles by means of hand-pressure, whereby it is made more strongly coherent, and is thus prepared for the further condensing action of the mallet. If the mallet were applied from the first to the soft, loosely-held-together piece of sponge gold, the effect would be to disintegrate it, or break it up into particles; but if partial condensation is first secured by hand-pressure, the cohesion of the mass is sufficiently great to withstand any amount of malleting, which only serves to further condense and solidify it.

Before dismissing the question of margins I wish to allude to a device which I have used to secure perfect marginal finish where the cavity edges have been prepared otherwise than square, as before advocated. When the cavity is filled flush with its margins with crystal mat, thoroughly condensed, the margins can be made perfect by malleting on several thicknesses (three or four) of No. 20 rolled gold to perfect the margin, and then continuing with crystal mat until contour is fully restored. The points with which I have secured the best results are the finer numbers, extremely small, with shallow serrations. My habit with foil fillings is to use a rather broad surface-plugger, but I have found better results in using crystal mat with the fine points, as noted. The cohesive quality of crystal mat is quite remarkable. In several instances where I have found imperfections of margins on the labial aspect of approximal incisor fillings, a defect, for instance, which had developed under the use of the plug-finishing burr, I have been able to add to the surface a sufficient quantity of crystal mat gold to restore the imperfection without making any grooves or retaining-points in the gold. In other words, the surface of a plug made with crystal mat gold which has been cut by a plug-finishing burr is sufficiently cohesive to retain additions of cohesive gold to its surface and form a solid filling without undercutting or grooving the plug for the purpose of gaining a retaining hold. The point at which condensation has been perfectly performed is well indicated in the color of the surface, which changes under the mallet as the

condensation progresses. By constant malleting the brown tint of the crystal mat gold disappears, and its color becomes lighter and lighter, until it is in no way distinguishable from that of a foil filling. If, during the process of malleting, the surface of the gold plug be examined from time to time with the glass, it will be seen to present areas which are perfectly bright and metallic-looking, and of the normal gold-color, and between these, slightly darker and brownish particles, which represent the non-condensed particles of crystal gold. The malleting should be continued until all of these brownish specks or particles disappear and the surface of the plug presents a uniformly golden-yellow appearance and solid metallic texture. An extremely valuable use which I have made of crystal mat gold is in connection with an oxyphosphate of zinc lining in cavities of extensive decay, where the walls are so weakened or imperfect that further cutting, for the purpose of securing anchorage, becomes undesirable, as producing an element of weakness in the operation. In these cases I have adopted a plan which is a modification of a method suggested by Dr. Oltramare, in a paper before the last Swiss Congress, as follows: The cavity is prepared with as much anchorage in the tooth-structure as is obtainable, consistent with strength, and then lined with a small amount of oxyphosphate of zinc in a rather soft, sticky condition. A pellet of crystal mat gold, approximating the form of the floor of the cavity, is embedded for about half its depth in the cement, and time given for the cement to thoroughly harden. All excess of cement is then removed with an excavator, and the crystal mat gold is afterwards condensed and malleted strongly to place. This furnishes a cohesive foundation, upon which the balance of the filling may be applied, in connection with such retaining anchorages as it has been otherwise possible to secure.

A large number of fillings inserted in this manner during the past year have been extremely satisfactory, and show no evidence thus far of any tendency to leak or become loose. The rapidity with which a filling may be made with crystal mat gold is somewhat remarkable. I have made no accurate time observations in comparison with foil, so that I cannot give exact data in regard to it; but I am quite sure that the time consumed in the filling of a cavity, by the method described, with crystal mat gold is from a third to a half less than would be required to do the same operation with foil. Its great value, so far as rapidity is concerned, is demonstrated where extensive contours are to be made. It is not my intention to advocate a wholesale use of this material, to the ex-

elusion of other forms of gold. My object in calling attention to it in the manner here described is to emphasize what I believe to be a fact,—that perfect fillings can be made with this material, in certain classes of cavities, with more ease and rapidity, and with as good, if not better, results than with foil. The objections which have been raised to the extensive use of the ordinary sponge, or crystal forms of gold, are no doubt just, and have had their foundation in several causes, which, in the form of sponge gold under consideration, are, I believe, obviated. In the first place, the preparation is absolutely pure gold. At the time sponge, or crystal, gold was first introduced to the notice of the profession, or soon after, a number of processes for making this material were published, and the consequence was that many dentists made it for themselves, or its manufacture was lodged in unskilled hands, with the result that the product was more or less contaminated with substances which acted injuriously upon the tooth, or in some way affected the integrity of the filling. More than this, the crystal form of the product was not uniform, and was so variable in the shape and size of its ultimate particles that no two samples acted or worked in exactly the same way; hence, great variety in results was the natural consequence. Again, it was put upon the market in large blocks, and it was left to the operator to cut or tear apart, getting pieces of irregular size and form, which introduced a feature of inconvenience in working-quality, resulting in irregular condensation of the mass, unevenness of the filling, pitting, etc. Such gold was known to ball up, or bridge over, and produce a plug which lacked homogeneity. Crystal mat, besides being an absolutely pure product and free from the chemical impurities which characterized the earlier preparations of sponge gold, is furnished by the manufacturer in pellets of assorted sizes, so that the operator has ready at hand a range of sizes from which to select the pellets for filling a given cavity, and with these at hand, and a uniform mallet-power, the work proceeds evenly throughout, resulting in a perfectly homogeneous plug. In conclusion, the best results with this material, I believe, are obtainable only with the Bonwill mechanical mallet, with a spring-roller cam. The character of the blow delivered by this instrument, properly adjusted, produces a result which I firmly believe is not otherwise obtainable.

A STUDY OF THE DISEASES OF THE PERIDENTAL MEMBRANE, HAVING THEIR ORIGIN AT OR NEAR THE GINGIVAL MARGIN.¹

BY H. A. KELLEY, D.M.D., PORTLAND, ME.

THE condition I am about to consider to-night is most familiarly known to you, no doubt, as that of Riggs' disease; but it behooves us to use professional language and methods. It is the aim of science to obtain as perfect a nomenclature as possible, and it is not proper to name a disease after its demonstrator, however much we may wish to honor him. But I do not think any one name can designate the conditions. There are many under this one head, seemingly the same and yet very different; having variable symptoms and exciting causes. It seems to me much of the difference of belief in earlier times and even to-day in regard to this disease was and is due to this fact. These have not yet been classified, but are regarded as one pathological condition. Nothing but confusion can result from this, and it is not strange to find many theories in regard to it, and especially as to its origin.

It is the purpose of this paper to give certain conclusions of mine, in hopes that I may contribute something that may aid us to a clearer understanding of a disease so destructive in its results and yet so little understood.

Salivary calculus, I think all will agree, is not the cause of serious disease. It is deposited at or near the salivary ducts at the gingival margin or just above it, towards the cutting edge of the tooth. The theory of this precipitation is as follows: The saliva contains both calcium phosphate and calcium carbonate, and these are held in solution by carbonic acid before the saliva is poured into the mouth. As the saliva enters the mouth this carbonic acid escapes and the lime salts are precipitated. This may be shown experimentally by a bottle with these salts in carbonic acid solution; allow acid to escape and salts will be precipitated. As the calculus pushes the gum down new deposits form, and as a result the gum may lose its tone and thus a more or less serious state of affairs result. But I think there is no attempt of this kind of calculus to work in under the gum margin, and only by the greatest neglect can it do serious harm.

¹ Read before the Maine Dental Society.

It is easily sealed away, and when so removed we find the gum underneath it in practically a healthy state,—only a more or less loss of tone being seen as there has been more or less neglect. The gum soon returns to its normal condition after its removal.

The results, possibly caused by serumic or sanguinary calculus, must be considered. First, we do not know this species of calculus comes from the serum, or even from the blood. It is only a belief based upon certain analyses. "There is no evidence that it is derived from the blood. It may possibly be deposited from the pus bathing the tooth and more probably from the saliva." (Truman.)

It certainly is different from ordinary tartar, and much more destructive in its results. Salivary calculus is a semi-solid mass, composed chiefly of water, calcium phosphate, and calcium carbonate, with a trace of calcic fluoride and magnesium phosphate. It is easily sealed away, as it does not seem to firmly adhere to the tooth as does the serumic. The latter, on the contrary, is a very hard substance, and removed only with great difficulty. It has not been analyzed, and I cannot correctly give you its constituents. What relation does this calculus bear to the disease?

In one of the latest papers on this subject, Dr. Allan says, "To me it always seems that much of the trouble that many dentists meet . . . arises from a total misconception of its origin and cause. . . . I desire to state positively my belief that pyorrhœa alveolaris is always preceded by a deposit of serumal tartar." This statement he enforces later by saying, "If I had said, as a rule, the so-called pyorrhœa alveolaris had its origin in a purely local cause, or causes, and that nine out of ten times this local cause was tartar in some of its protean forms, I would have rightly stated my opinion. I go further and say the constitutional diathesis theory begs the question and cannot stand close examination. All that can be said for a systemic origin is, the inflamed gingival or mucous membrane is prone to secrete lime salts, and these salts, in turn, become added causes of irritation." Dr. Allan believes the healthy mucous glands do not secrete tartar, and he regards a natural or acquired roughness of the neck of the tooth as the exciting cause of the unhealthy action of the glands that induces them to secrete the tartar. Dr. Allan says, while strongly of the opinion that this is correct, he is not sure of his position.

These are strong words and fill us full of hope that Dr. Allan has at last settled something. But this hope is quite dispelled, and we find ourselves again in doubt when, in the discussion of this paper, we hear the following from Dr. Truman: "Now, what is

the origin of this pathological condition? Does it originate from tartar? Not if I understand it. Does it originate from the roughness of the gingival border of the teeth that Dr. Allan mentioned? When you find a bright red line at the border-line of the gum, there is the beginning. It has nothing to do with tartar. It may come from constitutional disturbances; it may originate from some form of nephritis, or a long siege of sickness. Immediately succeeding we have a development of micro-organic life. This disease has its origin in inflammation of the periosteum or pericementum of the roots of the teeth. There is no question about that. It naturally follows if we are to treat the teeth properly we must direct our attention to the micro-organic life first, and not to the tartar, which is secondary. Where tartar is, in my judgment, there cannot arise—does not arise—this pathological condition." Dr. Sudduth agrees that tartar is secondary to the disease, but says, "The initial phase we do not know. No man has ever been able to tell the cause of the disease; there is a catarrhal process, but what causes that to be set up has not as yet been solved. The deposits on the roots is a result of this catarrhal process. First, there is irritation, then follows micro-organisms, and these, in turn, become a source of irritation; but their direct connection with the disease has not been determined."

Many of us think the very worst cases we have ever seen were entirely devoid of tartar, either serumal or any other kind. Now, it seems to me, in this disease, accompanied by deposits of tartar, we have what I consider one of two conditions that are described by various authors by the same name; and it also seems that whatever may be the predisposing cause, the exciting cause is the so-called serumal tartar.

In support of this statement I fear I can but repeat the old reasons for and against the local causation of the disease, but hope to be able to present them in a way that will convince you of their truth. It is my belief, as stated by Dr. Allan, that those persons that support the systemic theory only beg the question. It is so satisfying to throw the disease back on to the system. But what reason have we for so doing? We have a pathological state here, always accompanied by calculus, which may be cured by the simple removal of the calculus, nothing else being necessary. The only way it can be treated is by the complete removal of this, and by so much as you thoroughly accomplish that will you succeed. Could anything point more clearly to the cause of the disease? Systemic conditions are but side issues; important, but not

the origin. In support of this statement I need to present but the one fact, a complete removal of the calculus will effect a cure. Not one case is on record of failure where this was thoroughly done. If the system was at fault there would be exceptions to this rule. Dr. W. D. Miller says, "My view is, three factors must be taken into consideration in each case of *pyorrhœa alveolaris*,—first, predisposition; second, local irritation; third, fungi."

I pass now to the last form of the conditions we are studying, the condition called phagedenic pericementitis. Many have adopted this name to designate all the lesions we have been considering. I prefer to use it as descriptive of this one condition. This, then, as the term implies, is an inflammation of the pericementum, resulting in rapid ulceration. The gums are but slightly affected. Thin flat instruments can be passed farther up the root than is possible in a normal condition. The destruction of the tissues of the peridental membrane has begun, and the pockets, that I mentioned as indicative of the disease, are forming.

This destructive process proceeds in the direction of the fibres of the membrane,—that is, towards the apex of the root. It may affect but one side of the root, and there may be pockets with healthy membrane between; but usually the affected tract widens and destroys the entire root membrane. Although it seems to be an infectious disease, the fact is not fully established. There is little or no recession of the gum, and the condition may be overlooked except a very careful examination be made. As a result of the loss of the membrane, the alveolar process disappears.

I have thus briefly described the simplest form of phagedenic pericementitis, but by far the greater number of cases are complications of this disease and due to calcic inflammation.

I have said of this form I believed the exciting cause to be calculus, but as the disease may certainly begin and run its course without any deposition of calculus, we must turn elsewhere for the origin. And it seems highly probable it is due to fungi or some form of micro-organism, and as I have said is, or seems to be, infectious. Dr. Black thought, at one time, he had isolated the fungus; but further investigation did not confirm his hopes. Miller has not been able to demonstrate the special organism producing it.

The treatment will be more in the line of suggestive hints than an attempt to describe any special mode. When the pathology is understood the treatment becomes easy. Until this is accomplished our treatment must be ineffectual. Where we are not sure of our foe it is hard to choose our weapons of offence and defence.

The conditions due to calculus are simple, and demand for their cure the exercise of surgical means and methods. Remove the calculus and all diseased alveolus (this must be thoroughly done by giving several sittings); establish drainage; accomplish depletion and give the affected teeth rest, and there you have the means of a cure. In proportion to the thoroughness with which this line of treatment is carried out will be your success. No medication is necessary if this treatment be thorough. But it is well to give the system tonics and use stimulants and antiseptics locally.

In the condition called phagedenic pericementitis the first thing is to remove any deposits that may be present as complications. After this is thoroughly accomplished it is absolutely necessary to resort to medicinal treatment. There is in well-developed cases no chance of nature effecting a cure even with the calculus entirely removed, for the exciting cause still remains. The pericementum is being disintegrated and the alveolar wall absorbed. We must remove the diseased parts with instruments. Dr. Black would not injure the gum margin, but drainage must be secured, and this must be obtained at whatever cost. Then the lacerated pockets should be washed out to remove the débris and blood-clots. For this use a solution of mercuric chloride in peroxide of hydrogen, one grain to the ounce. If there is great congestion of the gum, apply a thirty per cent. solution of chloride of zinc deep down into the pockets. Then proceed with Dr. Black's one, two, three solution.

Oil of cinnamon, 1 ;
Carbolic acid, cryst., 2 ;
Oil of gaultheria, 3.

Inject this into the pockets, once in four days, full strength, and supply the patient with the same solution diluted to one-half its strength with oil of lemon or oil of anise,—I prefer the former,—to be used as a mouth-wash. The patient must be watched carefully, and great care must be taken to prevent a return of the irritation of the gum margin, and cleanliness must be insisted upon, with examinations continued indefinitely, for I do not believe a cure could be absolutely promised with unfavorable conditions likely to recur.

MANUAL TRAINING.

BY S. B. PALMER, M.D.S., SYRACUSE, N. Y.

THE addition of the third year to a course in dental colleges was a step in the right direction for progress in dental education.

With one-third more time for instruction, and to answer the demand for higher skill in the working of metals and in the construction of crowns and bridges, a course of study could be arranged to meet conditions at present not provided for.

There is not sufficient time spent with students in manual training to enable them to meet the requirements of practice. It is true this education may be acquired by a special course, at an expense which few can afford. Mechanical training comes in at the close of study rather than in the early part of the first term, so that the student is not able to enjoy its benefits throughout the full course.

I know from experience with the teaching of students early in my practice that a systematic course of study can be so arranged that manual training can be combined with the other studies and become pastime or recreation rather than a task. In training the fingers, work must be performed and directed in a way to produce something useful for the worker, and when this is done the mind becomes interested, the real labor forgotten.

I will venture to offer a few suggestions how it is possible to make mechanical training a recreation, and will simply mention what was laid out for students in the office thirty-five years ago.

Attention was first called to the furnishings and fixtures in the laboratory, then to the tools, and the advice given, "You will need all these, so commence and make for yourself what you can, and add as you may learn more, and make other things, until you have done all that the tools will enable you to do." Before the time of pupilage was over nearly every one had a complete outfit, with perhaps the additional assistance of a machinist to construct lathes, etc. The work was not limited to the laboratory. Dr. Hodson, of New York, is proud of a set of ivory-handled socket pluggers which are now in use by him, made during his office study in Syracuse.

For over twenty-five years I have not taken students, believing it best that young men intending to enter the profession should go at once to college rather than waste time in office service. In

theory I was right; observation convinces me that practically I was wrong. The office student after graduating is much better prepared to enter practice than one who graduates without previous training.

It is not the professional teaching received in an office that places him in advance; many things must be unlearned, or still worse are retained; but the manual training received, which a private laboratory offers, is not enjoyed individually when a large class is being taught. In proof that mechanical training is of importance, though it be not directly in the line of college instruction, I will cite two cases. Two young men, by my advice, entered dental college without office study; both were limited in means and alike ambitious to succeed. After graduating in the two years' course, one came to me with a cast, for advice in a case of regulating. The case called for a simple gold appliance that required soldering in its construction. The young man said, "I have my diploma, but it is all a farce. I know nothing practically about soldering or working gold, and have it yet to learn." The other young man was proud to inform me at the close of his first term that he had added to his means by making, or teaching the boys how to make, metal cases. Where was the difference? The latter was a son of a fine mechanic, a model-maker, whose shop was a part of his dwelling, the boy's play-house; the use of tools was familiar to him, and once shown a thing to be made, and told how to make it, he could duplicate it. When a practical jeweller takes up dentistry he asks no one to assist him in constructing deposit cases.

Of course there will need to be an outlay on the part of the college to furnish facilities for this training, but there is demand for it, and there will be a supply. If colleges cannot do it individually, they could unite upon a plan to recommend the first year's course at a manual training college, and receive the diploma from that institution as one year on the course, and thus require but two terms. The course of study should be after that of the Chicago training school, or that of some universities, in the course of civil and electrical engineering, where each student has practical instructions in blacksmithing, wood-working, moulding, casting, the use of engine lathes, etc. The dental student should have for his lessons the making of things required in practice after graduating; he should make patterns for flasks for vulcanizing, turn out handles for bench tools, cut strips of brass, bend, solder, and turn up ferrules to fit the handles, and, later on, when chemistry is reached,

nickel-plate his brass productions. He should cast flasks, forge bolts, and fit up the same; he should be taught to make and temper excavators and other fine instruments. This is not recommended for the saving of money, as no operator can afford to make fine tools, but as a part of educational training to meet emergencies that often occur in practice.

The above suggestions are based upon practical knowledge that students can be taught to work out their own manual training and regard it as pastime and not a task. What is true of private teaching can be enlarged upon and be made equally practical in college training.

Reports of Society Meetings.

AMERICAN DENTAL ASSOCIATION.

Second Day.—Evening Session.

(Continued from page 60.)

DISCUSSION ON DR. MORRISON'S AND DR. CRAVENS'S PAPERS JOINTLY.

Dr. Head.—I should like to ask if Dr. Morrison will give us some idea of how many of his implanted teeth have lasted five years after the operation has been completed?

Dr. Morrison.—I should judge not more than twenty per cent. I have a list, but I have not looked at it for some time.

Dr. Swasey.—On this subject of implantation, I was impressed with the fact that Dr. Morrison failed to secure a favorable result with his first case. In answer to the query how long the teeth lasted, he said that about twenty per cent. of his cases have been successful for five years. I had a call from Dr. Younger some time ago, and I felt that I had been remiss in the practice of dentistry from the eloquence with which he described his operations.

On this subject of matrices, it seemed to me that he objected to anything malleable in approximal cavities. I would not use a steel matrix, but should want something unyielding. I prefer a brass one that can be hammered on to the wall of the approximal cavities. He also spoke of the obscure walls of the cavity. I do not believe many men fill cavities having obscure walls. His meaning

is not clear. I would not fill a cavity that I could not see. When this is done or the dentist fails to separate the teeth and uses a matrix that cannot be wedged on the other teeth, so that he cannot impact every portion of the tooth, I should infer he was not skilled in operative dentistry.

This question of matrices has been a great boon for many people, but it is not for one who prefers to fill a tooth right, who is careful that he gets his filling to the cervical margin; the only way to do it is to feel that when the matrix and the rubber dam are adjusted, and the cavity dry, he has a simple cavity. There is the secret of the adjustment of the matrix.

Dr. McKellops.—I have a little to say on the subject of the use of the matrix, as I think it a very important instrument. Dr. Jack did the profession a great service when he brought out this instrument. In the first place, it gives plenty of room. I must have room to see what I am doing. In that paper the author says he cannot bring up the edges. I bevel the edges so that I know they will be perfect when I finish the plug. I take a matrix, and I fit it. If I find the neck of the tooth a little too small, I place on my jack-screws or Perry's separator to hold it in position. I get my rubber dam on first, and then put those in to hold the tooth firm, and it gives no pain to the patient. If it is properly done the patient never feels the effect of the blow of the mallet. When you do away with that you cause suffering; and it should be the study of the artist to find out how much relief he can give his patient in operating.

In placing a matrix on, at the base of the gum it stands a little open. I want something to hold the matrix to the wall. I am going to fill the anterior cavity. I take a piece of orange-wood, and I bevel it the shape needed. Then a little varnish is added and it is forced in. That holds the matrix in place, and I am ready to go to work. I can spend two or three hours on the tooth without hurting the patient. It is a good thing when it is properly used, and the spaces are necessary.

As far as the implantation of teeth is concerned, we have all seen the operation. I have had a great deal to do with Dr. Younger, and have seen many of his cases. Some have been successful, but the majority have been complete failures. A few last five or six years, but that is all. I am not in favor of extracting teeth, but do sometimes. I will go to any extreme, and will go anywhere, to see a man operate. If he has anything new, I want it, to give to the profession, and to afford my patients relief and comfort.

Dr. Taft.—This seems to be a small matter, but after all it is a very important one. There is quite a diversity of opinion in regard to the use of this appliance—the matrix—for filling teeth. Some use it a great deal, others very little; some do not use it at all. A variety of appliances of this kind have been suggested to the profession. Dr. Jack many years ago brought out his matrix, a very good instrument or appliance, properly constructed, made of steel thin as possible, concave on the side that came next to the cavity, which was a proper form, of course. Then followed thin pieces of steel or other metals, placed simply in the space forming a simple cavity. Then there is the band matrix, which is made in various forms. Brophy has a band matrix, and also many others have introduced the same principle. The German silver band matrix referred to was suggested by Dr. Herbst some years ago, when he was in this country,—taking a thin piece of German silver, placing it about the tooth, and with forceps drawing the ends together, fitting it closely on the tooth, and then soldering it. It was a simple method of making a good band for some cases. Now, all these appliances may be good sometimes, but we find a great deal of faulty work resulting in operations made with this instrument. It is often observed that there are defective borders on the fillings; it may have come squarely against the edge of the border, and it will be found impossible to make a perfect adaptation of the filling at that part of the tooth.

While all the forms of matrices that have been suggested are valuable for certain cases, all these varieties should be at hand. Some will be better adapted to one case than to another, and so it will be all through the list. One point that has not been alluded to is the use of the matrix that will come up one-fourth, one-third, or one-half upon the cavity, as you choose. This forms the lower portion of the cavity, and it can be perfectly filled with ordinary care. After the upper part of the filling has been placed in position the matrix may be removed, and the remaining portion of the filling made without the matrix, care being taken, in building up along the lateral borders, to have it perfectly adapted and sufficiently flush or full to make a complete finish to the filling. In that way the difficulty that sometimes occurs in the use of the matrix when it extends to the grinding-surface of the tooth is avoided, and a good filling may be made, whereas if the full matrix were used, the border would be more or less defective. In that way there is room for the entrance of the instrument, the file or disk, the corundum wheel, or whatever is used to finish off. In

many instances I find this method of procedure better than using a band or ordinary matrix, and the difficulty that is liable to occur is avoided.

Dr. Darby.—I do not know how much those before me have said on implantation, as I have just entered the room; but it seems to me the subject is worthy of attention. There is a difference of opinion in regard to the value of this operation. The reply to the question as to how long these operations last would lead many to believe that they last but a short time. I do not pretend to say that implanted teeth will be permanent, but many teeth that I have seen have done good service for six or seven years, and are good to-day. I may be justified in relating a case which came under my observation within the past year. A lady went to San Francisco and had six teeth implanted by Dr. Younger,—four cuspids and two central incisors. For six years these teeth did good service. An accidental bite, as she termed it, had loosened and caused one of the central incisors to fall out. The lady applied to me for treatment, and I suggested that she allow the socket to heal, the root having absorbed. I introduced a little denture with a single tooth on it. A few months afterwards I made a new socket through dense bone, and I happened to have in my collection a tooth nicely adapted, and well matching the other incisor. This tooth was implanted, and after a few months it became firm, and is so to-day. For a period of seven years at least that central incisor and four bicuspids have been doing good work. Whether they will remain so, I cannot say. I am of the opinion that the majority of these teeth will be failures. I do not think we always distinguish between the two kinds of attachment. I allude now to those cases where we have bony ankylosis. In such I think the tooth will be permanent. My own experience has not been equal to that of many other gentlemen. I have implanted thirty-six teeth, and, as far as I know, but five have been failures. Some have been in between three and four years, and to all intents and purposes are as good as any in the mouth. I can recall many instances in which these teeth are perfectly firm, and I should not know that they had been implanted teeth if I had not implanted them myself. Some cases are exceedingly valuable. Take a central incisor, for instance; no other tooth in the mouth has been lost; from accident, breaking off of the crown, or any other reason, it becomes desirable to implant a tooth. In many instances it may last three or four years, and if it is lost, another can be implanted. In some instances I have had central or lateral incisors that had been crowned and the

roots split. I have had good roots upon teeth that had defective crowns. I have crowned an artificial tooth on a good root, and it has taken hold as well as a whole natural tooth. In instances of that kind I think implantation is extremely desirable, and in the event of failure we can implant another.

I will relate a case of a young lady. She had lost two teeth, and was wearing a gold-plate. After she was married, her husband brought her to me, and I found she had lost the two bicuspids in the superior jaw. It was then that Dr. Younger first suggested the operation of implantation. I had seen him perform the operation, and I suggested implanting one bicuspid. I had one that I had drawn from the mouth of a child in correcting irregularity. The lady sailed for Europe, and she wrote me that the tooth was firmly fixed, and when she came back she wanted the other one implanted. I did so, and she went to Europe again, and when she returned, after two years, both teeth were as solid as the day I put them in. Even if those teeth failed in five years or more, it would be easy to implant others. I do not want the operation of implantation to receive any discouragement from those who have spoken on the subject.

Dr. Morgan.—There have been some views advanced that I cannot let pass unchallenged. I agree with most that has been said. The first criticism that I will make, however, is on what Dr. Darby has said about ankylosis. I do not understand that there is any such thing as bony ankylosis. We have ankylosis of the parts, but it is a union of the cartilage, not of the bone. Taking that view of it, I think bony ankylosis is an improper term to apply. I think it becomes encysted, and the fibrous substances hold it in place, but there is never any bony union; the dead and the living do not unite, and when you have a tooth out of the mouth for eight or ten years, it is dead in the full sense of the word.

Two gentlemen have said that teeth cannot be filled unless you can look into the cavity and see every portion of it. Some of my best work has been done where I could only see a small portion, and I have been in the habit of doing it, as my patients and my brother practitioners say, successfully ever since I commenced to practise. Take, for instance, the posterior surface of a second or third inferior molar, which occasionally requires filling. I have often filled one where only a small portion of the pulp could be seen. Of course, I use a glass to aid me, but I have always relied as much on my sense of touch as I did upon the eye or the glass. Take the left inferior maxilla. I stand on the left side of my pa-

tient, and with an instrument carry into the cavity, for the beginning, a cylinder of soft or non-cohesive gold, and then I fill it until it is full. I do the packing by the sense of touch, and then compress the surface and polish it, relying upon the glass to secure the finish I desire. I have done it for nearly fifty years, and I know it has been successful, because of the results. I always begin with the easiest mode of filling cavities, and for that purpose I use non-cohesive gold. I do it satisfactorily without looking into the cavity. I know that one gentleman in this room has been in the habit of doing that thing for forty years, and he could tell exactly the same story. I will also say that while I have used cohesive gold almost from its first introduction as a material for filling teeth, I still cling to my first love to a great extent, and use quite a large proportion of non-cohesive gold.

Dr. McKellops.—If pure gold is not adhesive, what is it? If it is pure, it will adhere. You cannot get over it, call it what you will. As far as seeing into a cavity is concerned, I say you cannot take a mirror into a cavity. It cannot be prepared right. If it is an inferior wisdom-tooth, it cannot be filled with the success that I can fill it by going down and seeing what I am doing. It cannot be a success, and I challenge it.

Dr. Morgan.—I do not claim to make perfect fillings. I claim to make such as preserve the teeth, and I have yet to see operations from any gentleman in this country whose fillings are perfect when brought to the proper test.

Dr. Ottofy.—I was very much delighted in listening to the remarks of Dr. Darby on implantation. I was rather diffident about the subject at first, but I am at present as much of an enthusiast as I ever was. I think when Dr. Younger came East he was obliged to implant teeth indiscriminately in mouths not properly suited for it. Unfortunately, under those circumstances, nothing else could happen but what did, and that was that most of the teeth failed. There is no question that his private practice is entirely different from that. I agree with almost everything that Dr. Darby has said, but there are very few perfect natural crowns to be had, and often those that seem perfect have the enamel chipped, and I have lost several beautiful cases from the fact that the enamel and portion of the tooth have broken away beyond the alveolar border, causing irritation and eventually loss of the tooth. At the present time I invariably cut off the crown and attach a Logan crown, making the connection between the Logan crown and the root of gold, simply attaching the Logan crown carelessly, so as to leave a

space where I put in a gold filling. In that way the tooth is perfectly strong, and can be changed in shape if desired. I have some cases that are from five to six years old, and there is nothing more beautiful than an implanted tooth in a perfect condition. Most of my first cases failed. They were poorly done, and they were not suitable for the operation. There is hardly any case that I have selected for implantation that is not in good condition, and they range from two to five years. Some one has asked, How long will they last? Dr. Younger first implanted those teeth about seven years ago. Much of the work has been done within the past five years, and we can safely say that they will last from four to seven years. Others can be implanted when these are lost. In cases where a root absolutely must come out, the socket can be kept, and a tooth implanted without any pain to the patient.

Dr. Jackson.—I would request that Dr. Allport give his experience in filling teeth with soft gold. Many of the younger members would be greatly benefited by Dr. Allport's experience. Many of us have lost sight of the discussions which have taken place on the subject. I think soft gold is considered a good safe filling. Why should we not be put in line again to study out and know the advantages in the use of this material?

Dr. Allport.—In regard to perfect fillings, I want to say that a perfect filling would be one so dense that it would be like molten gold, and with every portion of that cavity filled as closely as a most perfect-fitting cork could fill it. However, such a filling was never put in by any living man. A saving filling is what we need; of course we want perfect fillings, but we cannot get them. Dr. Jackson spoke of the use of non-cohesive or soft gold. I suppose he means what I regard as the relative value of the two kinds of gold, cohesive and non-cohesive. Cohesive is good in some ways and non-cohesive is good in others. Neither will perfectly take the place of the other. In our present practice we could not do justice to our patients without using both. History not only teaches us of the past, but throws light on the future, and there is nothing better than to look back on the development of dental operations to get at the relative values of these two golds. Let us go back forty years or more. What had we then? But one kind of gold, and that was non-cohesive. At that time it seldom happened that a filling put in by a good operator discolored. Frequently we found them soft after they were taken out, and yet they retained their color. The trouble was that a portion of the fillings would be lost. They were put in by lateral pressure, and by forcing one piece into an-

other, and when failure took place it did so by one piece of the filling coming off and becoming separated from the other pieces. Half would come out, and yet the balance would be perfectly good, and I have even repaired such fillings. What did we need then? We required something to make a good surface to that filling and prevent pieces from falling off. Then came crystal or sponge gold. All crystal or sponge gold is cohesive, and this gold was very useful to be used over non-cohesive gold. It was exactly what we wanted at that time. The fillings of Dr. Morgan and Dr. Westcott did not discolor. They introduced this crystal gold, and everybody used it. What was the result? Very soon we heard that the appearance of teeth was so marked that our journals were filled with accounts of it. The gold discolored, and it was said it was because the gold was impure. But that was not so; it discolored because of leakage; exactly the same as they do to-day, because they do not fit the walls of the cavity. Take Dunning's or Townsend's or Harwood's, and you find no better fillings. There we have the two filling-materials, the non-cohesive and the other, which we need to put there as an enamel, and the sooner we come to it the sooner we will get to a rational, sensible practice.

The trouble is, we have lost our old way of operating. It has been said that the best way is to see the cavity. I have filled hundreds of teeth that I did not see, except with the glass. With the fingers properly educated, as Dr. Morgan said, with eyes at the end of the instrument, a great deal can be done. I use mallet force every day, but I cannot do with the mallet what I can do with my hand. I have seen hundreds of old fillings, that have been put in between approximate teeth with old-fashioned instruments, that are perfectly good to-day. You cannot do it with your mallet pluggers and your cohesive gold. They would destroy a large portion of the teeth that would not be destroyed if you used the old-fashioned non-cohesive gold. Suppose you want to fill the edge of a posterior surface, and there is an undercut. You cannot do it with the plugger, but with the old instrument you can do it. You have lost more than you can imagine in not knowing the old-fashioned way of operating. I think as much of our colleges as any one, but while they pretend to teach the old-fashioned ways, they do not do so. The manipulation is so different, that a man who graduates does not know how to use non-cohesive gold. The old way was to take the gold and crowd it laterally towards the wall and bring it in front, and then in the centre, and put it all over. Now that they have the cohesive gold, they say everything must be driven from the bottom

up, or from the top down, all over the floor of the cavity. You can draw a sled up-hill, but you can slide it down much better. You try your instrument, and the tendency every time is to draw it from the wall, and the only way you can avoid it is to make the centre of the cavity higher. Suppose you watch every time you force your instrument in; you will see that the tendency is to press it exactly where you want it,—where your cavity leaks. You can do many difficult things. A man with much skill and time can put in a good filling with cohesive gold, but a man with much less skill and time can put in just as good a one with non-cohesive gold.

Dr. Swasey.—If I understood the sense of the paper on which I made the remarks, it was that in filling teeth with a matrix, a portion of the cavity was not visible. Dr. Morgan and Dr. Allport have endeavored to convince us that they have filled a tooth that they never saw, except by touch and with a glass. I have seen things through a glass which appeared more vivid than with the naked eye. I have filled a tooth with non-cohesive gold without seeing the cavity. I do not think that these men fill cavities oftener than myself, although they are older; but when they insinuate that every portion of the cavity must be seen, it was a misapprehension of my remarks. I want you to understand that I feel that there is a place for soft foil that has been established many years ago. As Dr. Allport said, the addition of cohesive foil makes it a perfect filling, but if one tells me that he fills a cavity without seeing the walls, I should be very doubtful as to the result.

Dr. Watkins.—I was much interested in the remarks on this paper on implantation. I had commenced to think that the subject had died away, but to-night we have had a very excellent discussion, and a very instructive one, in regard to it. I have performed some implantation, but not as much as others who have spoken. I want to relate just one case which I implanted five years ago. After it had been in the mouth for four years, perfectly solid, the outer cusp was split off. I removed the inner cusp and crowned the tooth. That was a year ago, and it is in good condition now.

Dr. Brophy.—Many years ago, when I was looking up the history of this matter, I found in the *American Journal of Dental Science* an article which appeared about thirty-five years ago from the pen of our esteemed friend, Dr. Dwinelle, on the use of the matrix, where he first proposed the use of this device, and I desire that our record should show this fact. The matrix is a most excellent device when properly understood and used, but when it is not understood and not properly used, it ought to be left entirely alone.

The Secretary then announced that the committee of three recommended in the president's address will consist of Drs. E. C. Kirk, Louis Jack, and J. N. Crouse.

Adjourned.

AMERICAN ACADEMY OF DENTAL SCIENCE.

THE regular monthly meeting of the American Academy of Dental Science was held in the Boston Medical Library Association rooms, on October 5, 1892, at 7.30 p.m., President Brackett in the chair.

Brief discussions were held upon the following subjects: "Banding Fractured Roots," and "Various Methods of Root-Filling."

DISCUSSION.

President Brackett.—In the absence of other suggestions, it appears in order to begin the discussion of "Banding Fractured Roots."

Dr. Banfield.—A patient presented herself to me a few days ago with an upper central which was loose, sore to touch, and had a discharge of pus from its socket. Upon examination and inquiry I found that the root was supporting a banded crown. It had become fractured some years ago, and had been banded in the hope of maintaining it as a useful member.

Considering it useless to attempt the treatment of a root in such a condition, I extracted it, and, to my surprise, found that the process of banding, instead of bringing the fractured parts more closely together, had forced the apex of the fracture against the alveolus. I will pass the specimen around, and you will see how the apex of the slivered portion has been carried out in forcing on the band.

The history of this tooth is this: At first a crown with a wooden pivot was adjusted, and after being worn for some years the end of the root had become weakened, until it finally fractured; then the root was banded, with the result which you see. I present this specimen to you to show how easily we may be deceived in similar operations.

In the treatment of fractured roots, I first tie a ligature around the root, bringing the parts closely together; then make an application of compound tincture of benzoin to the inflamed gums, and wait twenty-four to forty-eight hours. As soon as the soreness has sufficiently subsided, I drill a small hole through the fractured por-

tions of the root near the gum and insert a gold screw. If there is a filling, it is replaced with Weston's cement, and care is taken that the opposing tooth does not strike the fracture in the act of mastication. The ligature can then be removed. After the parts are held together awhile by the screw and cement, the inflammation ought to entirely subside. The crown or remaining portion can then be removed or so shaped as to receive a band or cap. This method applies to fractures extending some distance above the gum. If, however, the fracture does not extend too far above the gum, I remove it, and, in fitting the band, cut it so as to completely enclose the space made by the removal of the fractured piece. I recall the case of a young man receiving a blow which fractured a central incisor; the fracture extended fully one-quarter of an inch above the gum on the palatal surface, and this space was completely covered with a portion of the gold band. This operation was performed some ten years ago, and to-day the parts are in a good and healthy condition, thus showing that the gum-tissue will in many cases admit of the band when properly adjusted.

Dr. Allen.—While listening to the remarks of Dr. Banfield, and especially in examining the specimen he presents, I could not help being convinced of the fact that it is almost impossible to tell when we have really succeeded in banding a root after the method described, and that a post-mortem examination is the only means we have of determining the result.

I remember a similar case,—that of a lady who, for a number of years, had worn an ordinary crown tooth with a metal post on an upper central incisor. An incautious use of the tooth had split the root, causing inflammation of the socket and loosening of the crown. My treatment consisted in cleansing the parts and banding the fractured portions of the roots firmly together, according to the method just described; after which I reset the crown with oxyphosphate cement, and while the condition, generally, was greatly improved, and has so remained, I do not feel certain that the fractured parts are in correct apposition.

Another case, though somewhat different, was that of a left superior first molar, the fracture extending through the crown, separating the buccal roots from the palatal. As usual in such cases, there was much inflammation, and pus was exuding from between the fractured surfaces. The treatment here consisted in tying a silk ligature around the crown, to hold the parts together, then drilling through the crown cavity, which extended to the pulp-chamber, and opening the canals as well as I could. The canals

were found to have been previously filled with a solution of gutta-percha. I then enlarged the canal in the palatal root, and also the canal in the buccal root, and, taking a piece of irido-platinum wire, formed a little staple, which was fitted into the two roots, and which held them tightly together. This staple being cemented into place, the entire crown cavity was filled with oxyphosphate cement, after which I put a gold crown on the tooth. It is now three years since that operation was performed, and the tooth is still doing excellent service.

In cases where roots are slightly fractured one-eighth inch or so beyond the margin of the gum, I remove the broken piece, and make a gold band with a broad flange, covering the edge of the root from which the other piece has been removed. I have also succeeded admirably, in cases where the root has decayed to a high point on one side, by widening the band at that point and then capping the band in the ordinary way.

Dr. Andrews.—I remember a case of fractured root which has something of interest in it. Before I went into my present office, nine years ago, a young man had an ordinary pivot tooth put on, which was held in with either cement or gutta-percha, I don't remember which. Soon after, he fractured the root. A band was made of platinum and the pivot tooth again inserted. The platinum not only went around the root, but also part way over the end of it. That held until nearly a year ago,—all of nine years, I should say. For some reason the tooth became loosened, and while I was away my associate reset it again with red gutta-percha. That held for about two or three months, then came out again, and upon looking at the band closely I came to the conclusion that pressure had enlarged it, as blood oozed from between the fractured parts when moved. I took off the platinum casing or band, and with wire brought the parts closely together.

The fracture seemed to be from the front, running nearly down to the apex of the root. I then made another band, this time of gold, with a lip wider in front, to go upon the root, fitted it in as accurately as I could and burnished into place. Before putting it on, however, I dried out the root thoroughly, using gum sandarac, and put the tooth on with oxyphosphate. The tooth, apparently, is working very well.

Dr. Stevens.—In examining the tooth that Dr. Banfield passed around, it looks to me as if the fracture may have been caused by the insertion of the pivot rather than by the drawing in of the band.

Dr. Banfield.—I can't say in regard to that. It may have been decayed to such an extent that it could not be brought together.

Dr. Grant.—It seems to me that the tooth presents about the same features that any fractured root would, and I never believed it possible for any one to bring the two parts of a fractured incisor together and make a joint. The very thing which shows in this specimen is the very thing I should expect,—by pushing on an inclined plane the point of the fracture is thrown off. I have always in such cases cut the fractured part off at once. If it seemed to be short enough, and if the upper edge of the fracture could be reached by a lip on the band, I run the lip up there, and I have in one or two instances put a band on the end of the root and used it as a matrix, putting an amalgam filling in it, and then taking the band off. I am not a believer in bands in the front part of the mouth. I have yet to see the banded incisor root that did not become a disfigurement, particularly in people who have passed middle age. You may put them on young people and, if circumstances are favorable, and there is no tendency to recession of the gums, they do not show, but if the patient is over forty they are apt to show within a couple of years. I don't believe it is possible to repair the fracture of an incisor by trying to bring the pieces into apposition.

Dr. Banfield.—I would like to ask Dr. Grant, in a case of this kind, but with a clean fracture, how he would treat it except by putting on a band?

Dr. Grant.—I would take it out if I could.

Dr. Banfield.—Then you would have to extract the root.

Dr. Grant.—That's just what happened there. All things which are possible are not desirable. If such a root as has been described is banded or repaired, as the dentist thought he repaired it, and the patient is tortured three or four years, I don't call that good dentistry. My idea of good dentistry is to do the very best that can be done, and not attempt impossible things.

Dr. Banfield.—To illustrate, we have an abscessed tooth, and by treating that tooth we can make it useful for from five to ten years. Now, will you extract a tooth because it may last only five years? The same principle holds in the case of the abscessed tooth and the fractured root.

Dr. Grant.—I don't agree with you. I think the chances of success are quite different. If you treat an abscessed tooth, you stand a fair chance of being successful, but in treating a fractured root you are almost sure to fail.

Dr. Banfield.—But the tooth which has been shown lasted four

years. Here was this fracture which extended more than half-way up the root. Now, it seems to me that a band around a root of this kind, put on with a fair degree of skill, ought to hold the parts together securely and make a useful member. Suppose once in a while we do have a failure, it seems to me the successful operations will well repay us.

Dr. Williams.—I have a case of a left central incisor tooth which has been split and banded, or “hooped,” as I call it, and it has been doing good service for about ten years.

In regard to what is “good dentistry,” my idea is that we must know not only what to do, but how to do it. If you think it is necessary to band a fractured root with a wide, heavy, thick hoop, or section of a barrel you might call it, you make a mistake. You often get sufficient hooping with a fine wire. It keeps the parts of the root together sufficiently well and is all that is needed. In fact, to put on a heavy gold hoop to keep fractured parts together seems to me about as practical as taking a windlass to wind a watch. If the split is long, I would invariably hoop it; if a short one, rarely.

Dr. Banfield.—It would be interesting to hear from Dr. Williams how he adjusts this wire and secures it in place.

Dr. Williams.—I first wind a fine wire around the tooth, and then adjust gold wire slightly tight, and, after soldering the ends together, spring it over just under the edge of the gum, so that the gum covers the wire. The root is of a sufficiently even size to hold the wire where it is, and the band stays in place by its own tension. The wire used is a non-elastic wire. When in place, there is not tension enough to strain it, and there is no chance of crowding the upper end of the tooth out, as was done in the case presented here to-night.

President Brackett.—If no one wishes to add to the very practical discussion that we have had on this subject, we will proceed to the other topic,—“Various Methods of Root-Filling.”

Dr. Allen.—Root-filling is a matter that I have given especial attention to ever since I began dentistry. I think I have tried nearly all the methods, but, in the main, have adhered to one, and that is the use of oxychloride of zinc. I have not used it invariably, but consider it the best root-filling, and especially in cases of putrescent root-canals. I don't think I have had trouble in more than two per cent. of the cases that I have thus treated, and where I have had trouble I attributed it more to a faulty operation than to the method employed. To overcome the difficulty of sealing the

apical foramen, I employ this method. Assuming that the pulp-canal has been thoroughly cleansed, and ventilated for a sufficient length of time to get rid of the products of decomposition, I dry it out with hot air. This is accomplished by taking an ordinary chip-blower and drawing the air through the alcohol- or gas-flame, and inserting the point of the tube into the pulp-canal, compressing the bulb at the same time, and then allowing the bulb to expand to draw the air out again. In that way I get my canals very dry, and if I think there is likely to be trouble in getting the creamy oxychloride of zinc up to the apex, I take a piece of orange- or cedar-wood, a little smaller than the nerve-canal, and, after working in as much of the oxychloride as I can with the Donaldson nerve-broach, take the splinter of wood and drive it as far up as possible, and there leave it. I never make provision for opening a canal after having filled it; experience teaches me that it is unnecessary. If the root should afterwards give trouble, which very rarely happens, I know at once that I have not been thorough in the preliminary details.

I have opened a good many canals that have been filled with gutta-percha, and in a great many instances there has been considerable odor, and in some cases the gutta-percha itself has been in a putrescent condition. But in opening canals filled with the oxychloride of zinc, I have noticed an absence of odor, and believe that this substance renders inert any portion of decay that may have eluded my efforts to remove it. Of course, there are many methods of filling canals where the tooth has been devitalized and the pulp immediately removed, but I am speaking particularly of *putrescent* canals and my experience with oxychloride of zinc in such cases.

President Brackett.—The chair would like to clearly understand whether the last speaker feels justified in introducing this root-filling before the odor from the canal has disappeared, and before there is evidence of a general state of health of the investment of the root.

Dr. Allen.—I never introduce any root-filling until I have made myself reasonably sure that all products of decomposition have been removed. My method is to be as thorough in the first cleansing as possible, using peroxide of hydrogen to a large extent, and hook broaches and other canal cleaners to get out all the loose decayed substance. Then I leave a dressing within the root for from three to five days, saturated sometimes with carbolic acid, sometimes with nothing but peroxide of hydrogen, occasionally listerine, according to the amount of putrescence present. I find that I have occasion

to depend less and less on these substances according as I am thorough in the removal of the decay.

I continue this treatment as long as the odor persists, and when there is an absence of odor, I proceed to fill the canal.

Dr. Andrews.—My method of treating these canals I suppose is the same as used by many others. I do not believe in over-treatment. My aim is to cleanse the canal as thoroughly as possible. I seldom treat more than three times.

I find a very excellent antiseptic to use is a mixture of oil of cassia, oil of wintergreen, and carbolic acid, combined according to the formula of Dr. Black. I don't remember the proportions. In filling the roots I use chloro-percha, or liquid gutta-percha, and gutta-percha in the form of points, usually oxyphosphate over that, as I seldom fill the tooth permanently at this time. The filling is allowed to remain for six months or a year before permanently filling the tooth.

Another matter I wish to speak about is this: Dr. Stanton, president of the Harvard Odontological Society, spoke to me of his success in using oil of cassia combined with iodoform, and stated that he had had several difficult cases of abscessed teeth which he had succeeded in curing by this treatment.

Some time after this, speaking to a friend who is a druggist, I asked him if oil of cassia and iodoform could not be combined with some medium to make it dense enough to be rolled into points, like gutta-percha points. He thought it could be done, and, after experimenting, he made some for me, which I have used in several troublesome cases with good success. How long it will be before they dissolve, or, if they ever do, I cannot tell.

The gutta-percha points, when carefully manipulated, are so well adapted for pulp-canal fillings that I should be loath to give them up.

Dr. Eddy.—I should like to ask Dr. Andrews whether he attributes the good properties of that mixture to the oil of cassia or to the iodoform?

Dr. Andrews.—To the oil of cassia.

Dr. Eddy.—Then why not use some antiseptic like hydronaphthol, and be free from the objectionable odor of iodoform?

Dr. Stevens.—I use tannic acid and creosote in root-canals, and seldom have failures.

Dr. Eddy.—I don't see why the dentist should tolerate in his office the odors from the old-fashioned antiseptics, and neither do I see why it is necessary that he should require a number of sittings to treat and fill a root-canal.

A lady came to me the other day with a second left inferior bicuspid that was very much inflamed. The crown and distal surfaces were filled with gold. There was an abscess pointing to the lingual side. I lanced the abscess, removed the dead pulp, and cleansed the canal, forcing peroxide of hydrogen through the fistulous opening. Redrying the canal, I forced a solution of chloropereha and oil of cassia through the tract. Inflammation soon subsided, and the patient has had no trouble.

Dr. Stevens.—I suppose the gentlemen referred to me when he spoke about the odor from old-fashioned antiseptics. If you put tannic acid and creosote together, you get no odor from them to permeate the office.

Dr. Eddy.—I did not refer to any one in particular, but you cannot cover those odors so they will not be noticed. We may not observe it ourselves, but there is an accumulation of odors that the patients notice.

Dr. Williams.—I remember Dr. Charles S. Tomes, some years ago, mentioned that, in opening a tooth in which the pulp had been dead for some time, he always kept it bathed in eucalyptus oil, which at one time had quite a reputation as an antiseptic. If we needed a stronger antiseptic, we might combine the oil of cassia with the eucalyptus oil. There are so many nice things in the list of antiseptics now, that it would seem to be very easy to make a selection.

Dr. Andrews.—I used iodoform experimentally. It was recommended highly, and I wanted to see if it worked right in my cases.

I remember reading about a dentist who used a mixture of one-half arsenic and one-half oxyphosphate of zinc, and filled the root-canals with it, and stated he could cure any case no matter how bad.

Dr. Allen.—I think the discussion has brought out some points that I should like to try, such, for instance, as the essential oils, with which I have but little experience.

Dr. Andrews.—I sometimes find that, after drying the canals, there is apt to be still a little moisture at the apex. I find traces of it on the cotton used.

Dr. Allen.—I think the solution of oxychloride of zinc overcomes that, as it acts as a cauterant.

WILLIAM H. POTTER, D.M.D.,
Editor American Academy of Dental Science.

ODONTOLOGICAL SOCIETY OF PENNSYLVANIA.

THE regular meeting was held December 10, 1892, at the rooms of the Society, 1228 Walnut Street, Philadelphia, Dr. Louis Jack presiding. After the transaction of the usual routine business, Dr. Bonwill rose to a question of privilege, and this being granted, said:

"Professor Truman, in the discussion on my essay, 'Mechanics in Dentistry,' etc., remarked, 'It is no wonder Dr. Bonwill did not value his degree; he never earned it. If he had gone through the schools, day after day sitting on the hard benches, and had studied along with others, he would have appreciated the feeling all have as students and as co-laborers. He came into the profession through another door, and there I leave him.'

"First, not a word that I said was against the college that gave me my diploma nor any of its professors. I meant that I thought nothing of my sheepskin only so far as hanging it in my office. I laid it away for reference, and only brought it forth when the officers demanded it for registration. The Pennsylvania College of Dental Surgery offered a degree of D.D.S. to all practitioners of fifteen years standing if they would take out tickets for one course, undergo examination, and pay for diploma.

"After having studied medicine in Jefferson Medical College, 1864, Professor Buckingham offered to give me what was considered an honorary degree by simply paying for diploma and submitting to examination. I appreciate the diploma as I do the many medals I have.

"Now, all I ask of my old friend, Professor Truman, is to do what I know he will, that the world may know I did not 'get into the profession through another door,' as he has insinuated. If I am not worthy, then he should bear the blame.

"I beg pardon for bringing such a delicate subject before the Society, but, it being on the record, and as Professor Truman wrote me he would have cut it out had he known I did not hear him, I deem it best to reply. If he cannot do me justice, then I am unable to find one who will and can.

"I leave the matter now to Professor Truman and this deliberative body."

Dr. Truman.—In reply to Dr. Bonwill, I have only this to say, that my remarks upon the occasion referred to had allusion entirely to the feeling accompanying the reception of a diploma conferred after laboring assiduously for it, and that which follows the one

conferred honorarily. It was in this sense that I used the expression, "It is no wonder Dr. Bonwill did not value his degree; he never earned it." The balance of the paragraph makes the meaning clear, and I am surprised that any other construction should be put upon it. As Dr. Bonwill regards it differently, I wish to repudiate here distinctly any idea at the time of alluding to his work in the profession. If I were in favor of conferring honorary degrees for professional services, I would have great difficulty in finding one more worthy or better qualified to receive it than my friend, Dr. Bonwill. These need no laudatory notice at my hands, nor could any one by a word lessen the great value of the results of his laborious life. I certainly would not be that one. Hence I am glad to be able to make an explanation, and trust it will be accepted in the spirit in which it is given.

The subject was then passed.

Dr. Edward C. Kirk read a short paper on "Crystal Mat Gold," followed by a discussion of the topic presented.

(For Dr. Kirk's paper, see page 97.)

DISCUSSION.

Dr. Darby.—I have had a great deal of experience in years past with Watt's crystal gold. When it was introduced I was one of the first to try it, but my experience has not been as favorable as that of Dr. Kirk. I have found difficulty in working it, except in large, open cavities, where I could insert it with a broad-faced instrument. In cases of that kind I have found it very satisfactory; but the use I have put it to more commonly than others is, after bringing my filling near the surface, to use this gold for finishing. There it has worked very nicely. I have never been in love with Watt's crystal gold, and when asked why I use it I am sometimes at a loss for an answer. I think one reason is, that Watt's crystal gold, being a preparation of crystals, is liable to deteriorate more rapidly when exposed to the air. It presents a greater surface, and the crystals absorb moisture. I think it deteriorates more rapidly than any other preparation of gold.

Dr. Woodward.—I have used it, but to a very limited extent. My experience with it is something like Dr. Kirk's. If the gold is first carried to place, and partially condensed, and then malleted with any good mallet, it becomes very dense, is very cohesive, and sets where you place it. As long as the cavity is a large one I get along very rapidly, but when it is small it does not work as satisfactorily. The ordinary cohesive gold under a mallet makes

fillings that would be like wrought iron compared with crystal gold. If I wanted great strength in fillings I should use the ordinary forms of cohesive gold; but crystal mat is of great use for various forms and places; in filling undercuts, for instance, or in a molar in which there is a large cavity, with strong enamel, and it is undesirable to cut the enamel wall away. This can be filled entirely with crystal mat, and can be burnished with a small ball-burnisher. In starting cervical edges it is very satisfactory, and especially with a matrix, as it can be crowded in several layers, with a broad plugger, into place. There are uses for it, but I think we will have to get acquainted with it before we can tell what they will be.

Dr. Kirk here stated that it was only in the class of cases that Dr. Darby and Dr. Woodward had called attention to that he advocated its use.

Dr. Truman.—I have had a little experience with it, and, from my observation, it works exactly like all the crystal gold I have ever used. I like it very well for a certain class of cavities; but the question comes up always, when crystal gold is discussed, What is it, and what does it do? Crystal gold, whenever it reaches the wall, or border, can never, in my opinion, be packed exactly solid. That matter was settled twenty years ago. The Pennsylvania Association of Dental Surgeons, of Philadelphia, made extensive examinations of crystal and sponge gold. I then spent a great deal of time in microscopical examination, and came to the conclusion that it could not be properly packed against the wall, for the simple reason that the crystals slide one upon the other, and it seems impossible to secure perfect cohesion there. The result of its use was a constant complaint of leakage, that being ascribed to various reasons, but it was always considered as the action of the uncondensed crystals.

I have spent a great deal of time in former years in studying gold crystals, and the working of gold preparations, rolled gold, rolled tin, and other materials, and this labor satisfied me that we know very little about the action of crystals. Dr. Woodward has stated that when a mallet is used upon mat gold it condenses very well. This is true; but I prefer, in using it, to employ hand-pressure with a broad instrument. I think we can do quite as well without the mallet.

I have examined this mat gold microscopically, and have failed to discover wherein it differs from other sponge gold. The material is exactly the same as Watt's crystal gold, as far as I have been able to observe. I think it will be found of value, but that it will always be difficult to make it perfect along the edges of cavities.

Dr. McQuillen.—I have been rather more fortunate in the use of crystal gold than Dr. Truman. Six or seven years ago Dr. Darby told me of fillings he had put in twenty years before, and I think that after seeing those fillings I used more crystal gold. I commenced its use at that time, and have been using it ever since. I do not think any of us would depend entirely upon this form of gold. I have been delighted with the margins, and I seldom see or hear of a filling of crystal gold leaking that I have put in. They have been very satisfactory, and since seeing those operations of Dr. Kirk's, at the last meeting, I have been using mat gold in the cases he describes,—large operations. I have been very much pleased with the result.

Dr. Bonwill.—Gold is a very interesting subject, yet I don't use as much of it as formerly.

It is a question whether we have any necessity for a new gold; whether that which we have is not all that is required for the use of any one in inserting a gold filling. I have used one kind, and still adhere to Abbey's. There are some objections I shall urge against the use of mat gold. The essayist says he is obliged to use hand-pressure as well as the mallet,—hand-pressure first, and the mallet afterwards,—until it is a perfect homogeneous mass. He can pound a great deal longer than he can with foil. He states that it will not do to overlap the wall of the tooth with it. It cannot be bevelled as gold-foil, as the edges will break. I don't know of a greater demand at present than for the perfection of gold-fillings by bevelling the cavities and carrying them over the edge,—over the wall of the cavity to prevent the wall from breaking. If I am to be restricted in the use of that gold in this direction, I would not use it.

The doctor then explained what he meant by bevelling.

Dr. Peirce.—The fillings placed in by Dr. Kirk were faithfully done and conditions observed that made it very practical. It is very admirable work. I think, as was said by several gentlemen, that sponge gold has a place in the office, and it can be used to very great advantage in many cases. And I also wish to emphasize what he said, that we cannot build out thin edges because it has not the tenacity of foil. If I have a large cavity,—a molar, for instance,—with a good wall, I can fill the cavity with mat gold in half the time I can with foil, and make an operation as serviceable as it is possible to make it. In that way it does us good service because it economizes time, but if we undertake to build out thin edges we are certain to make a failure of the operation.

Dr. Guilford.—I think mat gold differs from the other kinds of gold we have had in the finish of its crystals. How it is produced I do not know, but I believe it is by a method of deposit. In depositing copper, preparatory to making copper amalgam, we can have coarse or fine crystals, according to the quickness or slowness with which it is deposited on the electrode. I suppose they have a means of preparing it slowly and in finer crystalline form.

Sponge gold, in various forms, has been presented a number of times in the last twenty years. I remember very well a circumstance occurring several years ago. Dr. Magill was quite an advocate of the use of crystal gold. He used it extensively in his practice, and he called a number of us to see several mouths he had treated with fillings of this kind, and they were very beautifully done. A few years after, he wrote that he had abandoned it. He found that, after all, he had been more or less deceived by it, and returned to the kind of gold he had formerly used. I think, as others have remarked, that crystal gold has its place. There is no doubt we can do good work with it, and it is as good as any other kind of foil, under certain circumstances and conditions, but when we violate those conditions we have failure. I think if we have proper access to the cavity the filling can be made of crystal gold just as well as any other kind, if there has been sufficient experience in its use.

There is another objection to it, and I think it is a very serious one. It is recommended especially as a finish for fillings and for use at the cervical margins of the cavity. That is just the place I should object to employing it. It is very easily torn, broken, and powdered. Upon surface fillings we can get along with it, but at the margin it becomes brittle. I should never think of using it there, and have always found it unsatisfactory.

I have tested mat gold quite extensively in the last few months. I used it recently quite satisfactorily in a molar tooth that had a very large compound cavity, and next to it was a tooth filled with amalgam. I filled the posterior part with amalgam and upon that laid crystal mat gold. In that kind of filling I have found great difficulty in making it unite with the amalgam placed in the cavity, but with mat gold this was readily accomplished. In connection with phosphate of zinc I think it is very excellent.

It has its uses, yet at the same time I think it is a gold we dare not take liberties with, and must be careful in its manipulation.

Discussion closed.

The question for the evening was then taken up for discussion,—

"Should immediate root-fillings be practised while purulent conditions exist at the apex?" Opened by Dr. Peirce.

Dr. C. N. Peirce.—This question, as stated, implies that there is some expeditious and comparatively certain method of either removing, or else rendering innocuous the previously existing or recently acquired purulent condition at the end of the root, other than by the usual one, of either antiseptics, disinfectants, escharotics, astringents, alteratives, counter-irritants, desiccation, etc., and that without the use of these remedies, and in disregard of the septic conditions, the root-canal and crown-cavity can, immediately on the discovery of this previously estimated unfavorable pathological condition, be filled, and that sole reliance for subsequent comfort and success can be had through either systemic conditions or local recuperative power; the inference being that this accumulated pus and septic condition which is recognized, is immediately, on the tooth being filled, to be either transformed into nutrient pabulum, building-material, etc., or else taken up by the absorbents and carried off as a waste product. I must confess that I have not confidence in unaided natural processes accomplishing these results, yet the inquiry upon which this discussion is based may be answered in both the affirmative and the negative, the correctness of the answer depending entirely upon the condition of the surrounding structures which are present at the time the thus affected root is to be filled; for instance, an established fistula penetrating the process and overlying gum, through which the product of decomposition can find a ready means of exit; and after the canal has been placed in an antiseptic condition filling is not only pardonable, but under some circumstances desirable practice.

Through the fistula the apex of such a root could be reached and the purulent condition as readily overcome or corrected as by the application of remedies through the canal, while by the immediate filling after these prescribed conditions were secured the function of the tooth would be regained and the tissue at the apex protected from the danger of increased irritation by the ingress of foreign substances through the canal. On the other hand, if the conditions at the apex of the root are such as are frequently recognized, and the accumulated product kept at its minimum rate by an open canal, then to close this means of relief and discharge without first checking its accumulation would, in my judgment and experience, result in an inflammatory condition which would be anything but agreeable to the patient, suffering continuously, until relief was gained by either an artificial opening or through the

pressure of accumulated pus, or absorption gave relief with a natural fistula. One or the other of these methods must be adopted to terminate the inflammation which will, with few exceptions, follow the abrupt closing of the only means of exit. These exceptions would of course be only in such cases as where the absorbents were sufficiently active as to overcome the accumulation of the purulent product; in that case it would be carried off with other waste material and the surrounding parts be thus freed or relieved from the septic influence.

There is another type where purulent conditions exist at the apex, and where, with a limited degree of safety, immediate root-filling may be practised. This is in teeth where the pulps had died without exposure. The cause of devitalization not being pertinent to the question, I shall not dwell upon it. Decomposition of pulp has followed, with only a very limited degree of irritation in the pericemental membrane at the apex of the root, but yet sufficient to establish a thickening of this root-covering, with some exudation, but both have been controlled by favorable systemic and local conditions, with activity of absorbents. The canal on being opened into is found filled with a yellowish fluid, but the parts around the apex have for months, probably, tolerated this condition, and would for months, and it may be years, longer. The opening into the crown and root has been made not to relieve suffering, but to prevent further discoloration of the crown. In this case, or in most of these cases, it is quite possible to cleanse the root, dry it as completely as possible, securing an absolute antiseptic condition so far as atmospheric germs are concerned, and fill at once with little or no danger of subsequent unfavorable conditions; and yet such treatment is not desirable practice.

Now, in these several conditions which have been indicated, where undoubtedly a purulent product exists, the remote but at one time quite general practice was to fill immediately, and then with a drill make an opening into the root-canal or pulp-chamber from just beneath the gum margin. This treatment has saved thousands of patients from discomfort while they yet had purulent conditions existing at the apex of root, but is it good practice except in some rare cases?

Dr. Register.—Since I have been using large quantities of hot and compressed air in connection with atomization my results in practice have been so different that I feel great good has been done,—certainly to my patients.

In regard to the question, I do not know whether it refers to

indolent abscess or whether to putrescence in the pulp-chamber. If it is to putrescence from devitalized pulp, and there was no fistulous opening, I should make use first of a germicide, and then arrange the dam in place and use the hot air in large quantities, so that desiccation is thorough, then fill it while it is in that sponge-like condition. I think that immediate root-filling is indicated; certainly, from clinical experience. It has been my experience that it is good practice. It has been my impression that this carbonaceous matter that exists in a devitalized condition is the cause of the subsequent trouble with teeth of that character. Some have the idea that if the apex of the root be closed the trouble is avoided, but I think that is an error.

Dr. Thomas.—It may seem presumptuous for me to say anything in regard to root-filling where there has been a discharge either from the canal of the tooth or from a fistula. It has become a question in practice,—How long is a dentist justified in treating that root to stop the discharge? Experience has accumulated in capping exposed nerves. It was advocated that the nerve could be capped and the tooth made perfectly useful, yet it was a common thing for patients to come to me suffering from this treatment. In a case of pericementitis the patient may not come back, and possibly septic matter may have infiltrated along the tissues and formed a fistula. The tooth is treated, but there is an increase of inflammatory symptoms, infiltration, and another abscess. It may be treated again, but only after the formation of a fistula does the patient get relief; consequently there is no reason to visit a dentist, and probably there is no attempt to see one, and after a while it has gone so far that the process between it and the cuspid tooth has necrosed and the tooth must be removed. Is it good practice, or how long is it justifiable in a dentist to continue with such a tooth? and I would like, individually, to know whether you can make a tooth of that kind perfectly healthy and do away with the discharge; or how long would it remain so, or how much security can you give the patient that it will be a perfectly and permanently cured tooth? It grieves me to have a patient come for extraction with a filled tooth treated for abscess with a large fistula supposed to be cured. What can I do, and can I make it a perfectly well tooth? How long are you justified in treating it for that purpose?

Dr. Truman.—It does not appear to me that there is anything in this question. It is, Should you fill a tooth while it is in a purulent condition? No; of course you would not. That is the only answer I would give to that question. But in the broader

sense, as I presume it is meant, will you do anything to a tooth which has pus in the canal? Dr. Peirce has taken up that point and handled it very well; but Dr. Thomas has brought up another,—Can we fill any tooth that has once had pus at the end of the root? I think you will agree with me, that pulpitis necessarily affects the pericementum. I do not think it is possible to have septic conditions in the pulp and not affect this membrane and increase further the development of pus; and wherever there is pus there must be destruction of tissue and a necrotic condition.

I have long entertained the idea that it was absolutely impossible to produce a healthy condition where pus has existed for a lengthened period at the end of the root. Immediate filling of such a tooth is, to my mind, impossible. We must change the conditions. If the root be necrosed, the dead tissue must be removed. If necrosis has not commenced, and the pulp is simply decomposed, it must be treated. Dr. Register says he accomplishes this by dry heat. I question this conclusion, as the heat required to destroy micro-organisms would destroy the tooth-tissues.

The whole territory of the dentine is filled with organic matter. It is in a decomposed state, and becomes a factor for future trouble. What is to be done with it? Years ago I recommended that it be coagulated, and that for this purpose chloride of zinc be used. It was said in answer that coagulation never would extend beyond the open mouths of the tubes. It has been demonstrated that it can be carried into the tooth. We can only approximate health in the treatment of many cases. When the destruction of the pericementum has been reached, we have arrived at a surgical operation,—cutting off the end of the root. Until that is done there will never be a healthy tooth in the mouth.

Dr. Register.—I rather hesitate to talk in reference to anything performed in my own practice. I offer the statement that I rarely at the present day have a fistula to treat. Only yesterday a lady came in to see me. She had a very bad molar and was in a very delicate condition. The central incisor had been treated for a number of years in the usual method. I operated on the tooth but once. It had a fistula and a gumboil at the end of it. I first washed it out with an atomizer, and after that by dilute sulphuric acid. I used this in about an eight-per-cent. solution, as a solvent to dissolve the carbonaceous matter that filled the tubulated structure of the dentine. I then followed this with Labarraque's solution. If it has a fistula it is given a treatment with acid of four-per-cent. solution.

I avoid using air intensely hot. The idea is to obtain thorough desiccation, and while in that condition to use some agent that will follow it up as a germicide. I have had a great deal of success with a preparation of from fifteen grains to an ounce of iodoform to an ounce of sulphuric ether. The odor is destroyed with oil of cinnamon. While the tooth is in this dry condition I saturate it with this liquid, and can immediately fill the canal with any preparation I prefer, either gold, or cotton saturated with phosphate of zinc or chloride of zinc.

Dr. Guilford.—I would like to know whether there is any one here who would have his teeth filled while there is a discharge of pus from the roots? It seems to me we would not be justified in doing for a patient what we would not want to have done to ourselves. It is evident, as far as the discussion has gone, that we have lost sight of the fact that there is such a thing as pyæmia. You remember how it carried off one of the Presidents of the United States. It is a serious matter, and I am surprised that it should be presented in this form. No one should think of filling while there are purulent conditions existing around the root.

Dr. Register stated that he did not mean to assert that he would fill a tooth having an indolent abscess. He desired it understood that he referred to a putrescent condition of the tooth-canal where there was no indication of a chronic abscess existing.

Discussion closed.

Incidents of practice were then taken up, and opened by Dr. Peirce, who said,—

I have a little matter here of some interest. There have been some questions in the journals in regard to the influence of abnormal conditions of the teeth in neuralgia and other disturbances. Some months ago a lady who had been present at one of my lectures on the influence of the teeth on facial neuralgia came to see me. She had worn an artificial denture for eight years. Upon examination of the mouth, I found on the left side a large tumor, for the accommodation of which the plate had been cut away. On passing a lance into the mass, an enamel surface was at once detected. On a free incision, opening it for the introduction of a pair of forceps beaks, an ordinary three-cusped, compressed-rooted third molar was readily removed. On further examination other teeth were recognized, which, upon removal with the forceps, proved to be three additional, supernumerary in character, united with apparently a membrane of connective tissue. On placing the four teeth together in the same relative position they had occupied

in the cyst, the upper and larger one, the representative of the normal third molar, had been embedded with its crown towards the cheek. The next in size was closely adapted to a depression in the larger one, and at a slight angle to its vertical axis. The third in size was, in similar manner, fitted into a depression of the second in size, and in the same line deviating from its vertical axis; while the fourth in size, not much over a sixteenth of an inch in length, or rather between a sixteenth and an eighth, fitted into a well-marked cavity in the third or preceding in size and description. The crowns of these teeth all possessed multiple cusps; the largest one had, as above stated, the three cusps of an ordinary third molar, while the second in size had quite a pronounced central cusp encroaching upon a proximal surface, with three cusps on the other proximal side and one on each side of the more central cusp. The third tooth in size had four rounded cusps, with a deep sulci in the centre of the crown. The fourth and smallest of the group resembled more an inferior bicuspid, with the cusp on one side much more prominent than that on the other, both cusps, however, being divided by slight sulci. The point of most interest to the patient was that in the removal of these abnormal growths the suffering, which had been severe and of long duration, was entirely relieved.

Dr. Darby.—I saw an interesting case a few days ago. A lady came to me with a tumor inside the cheek as large as a thimble. In a very solemn way she said she wanted to consult me about something in her cheek, stating that her father had died with cancer, and, while she was not frightened, she thought this was of the same character. I examined it and found a top-shaped tumor protruding into her mouth just opposite the molar tooth of the anterior jaw. I asked her if she was not in the habit of drawing her cheek in by suction, and she replied she thought she was. I found she had lost the second molar, and the wisdom-tooth was in position, and that the suction had produced the tumor. I told her I did not think it was a cancer, and procuring a piece of floss-silk, I made a loop and passed it around it to shut off circulation, and told her to report to me if anything strange happened. Within the next few days I received a letter from her saying the cancer had dropped off into her mouth, and she was convinced it was not malignant.

J. ATKINSON MCKEE, D.D.S.,
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Editorial.

PROFESSIONAL ADVERTISING.

THERE is probably no question that has received less attention than this. In a quiet way in society discussions, and in the promulgation of the moral laws deemed essential for the professions, it has entered not only in the ethical code, but has also, in a measure, become part of the unwritten law that becomes such a disturbing element, at times, in the conscience of every professional man.

The definition of the written and unwritten code is, however, not as clear as it might be made, judging by the means taken to promote individual gain by publicity.

The need of a true definition is nowhere more apparent than the difference made in the code of ethics between the sign on the door and the card in the daily newspaper. These may for all practical purposes be exactly alike, yet the one is accepted as very proper, if confined within certain limits as to size, while the other is usually regarded as very unprofessional. Exactly why a sign with Dr. John Doe, Dentist, placed to inform the thousands who perambulate the street should be considered right, while Dr. John Doe, Dentist, in the columns of a daily paper should subject Dr. Doe to censure under the code, is not clear. It seems but a question of numbers.

We are not disposed to quarrel with the mythical personage alluded to; indeed, he may be found in excellent company in many lands, and his bold assertion, that in so doing he is not violating professional usages, may have much to sustain it.

The question involves nice distinctions in ethical law. Yet it must be apparent to the most careless observer that the motive which influences John Doe to send his card to the newspaper is not strictly professional. The idea is clearly manifested in the action that he desires to make his name familiar as a household word, and to do that quickly rather than wait for the recognition of ability to give him an assured position in the community.

Whether professional men are right or wrong in their antagonism to advertisements does not concern us at present; the fact is quite clear that in many ways the professional advertiser is more than equal to overcoming any code, however strictly drawn.

Dentistry has received its lessons in this respect from the mother of the healing art, medicine, and has made its laws to correspond. The correctness of this needs no affirmation here, and yet it must be said that the devoted followers of medical science are not by any means indifferent to the pecuniary value of publicity.

If the question be considered solely from the stand-point of an advertisement, pure and simple, there would, probably, be no one to defend it; but there will be a difference of opinion when the question is presented, "Can a professional man give to a reporter an account of a 'remarkable case' and permit his name to go into the journal as the 'successful operator'?" Again, if articles are prepared for the instruction of the lay public, and unsigned, are they not indirectly an effort to call attention to the writer as one eminently qualified to perform more satisfactory work than his fellows? Have we reached the altruistic age when men do this unselfishly? It may be true, and we would not be thought to be impugning the motives of any who have performed this work; but the fact remains that any effort in this direction must prove a failure as far as the laity is concerned, and can only end in the interest of the writer of the articles by the silent, effectual, and universal knowledge that Mr. So-and-So is preparing a series of papers for the daily press.

The question whether such productions benefit those they are intended to educate has long been under discussion. There are certain basal facts in dentistry and medicine which should be promulgated and given as wide publicity as possible; but further than this the effort must prove a dismal failure. The proper place to begin the instruction in the care of the teeth is in the primary school, and it would not be amiss if this were occasionally a subject for selection in the Sunday-school. The experience of the writer in this leads to the opinion that seed sown here has never fallen on barren soil. Children eagerly absorb any simple facts of this character, and they are never lost.

Codes of ethics may not be equal to meeting all direct or indirect violations of law, and it is clear that some professional men approach the border-line of empiricism very closely in permitting their names to appear constantly in the daily journals. Newspaper men have their weak places, but no one will charge any member of that fraternity with the habit of doing something for nothing; and when certain names are paraded in their columns week after week, on the slightest pretext, it is not astonishing that the question is asked, "How is this accomplished?" Whether it be right or wrong for the public to insinuate motives, possibly not present in the indi-

vidual, it is invariably done, and professional character suffers in consequence.

A pleasant way of evading the professional law, more frequently seen in the past than the present, was the giving a dinner to one of the medical fraternity after a two months' sojourn in Europe. Of course, the recipient and all connected with it had space in the columns of the dailies without serious cost to the parties concerned.

The long interviews, detailing, with singular minuteness medical treatment in various epidemic diseases, together with the name in full of the interviewed, are supposed to be published solely in the interest of the public.

We have no idea that the means detailed to give notoriety will come to an end. There must always exist in all professions a certain number whose activities will not permit the slow advances which reputation will eventually bring. Their idea is that notoriety is an essential factor in personal progress, and who can blame them if they use the only means in their possession to obtain recognition. It is, however, not professional, let the motive be what it may. The dentist or doctor is worthless who fails to possess the highest skill obtainable at the period of his labor. This skill or knowledge can only be made apparent and available by accumulated evidence, and this requires time and persistent work. The advertisement of the day will not bring reputation, neither will it bring an increased clientele upon which he can depend. True skill in any line of work is of slow and oftentimes painful growth; but once attained, it makes the possessor master of his position in a pecuniary and professional sense.

DR. PALMER ON "MANUAL TRAINING."

In the original department of the present number will be found an article by Dr. S. B. Palmer, of Syracuse, on the necessity of a change in the curriculum of dental colleges. The advice is most excellent, and, coming from one who is practically familiar with all forms of dental work, should be seriously considered by those institutions, if there be any, not up to his standard.

We are inclined to the opinion, however, that Dr. Palmer is not familiar with the work done in the best schools at the present time, but rather bases his conclusions on the past.

It was very true that during the "dark age" of dentistry, when vulcanite superseded other forms of plates, the art of working in

metals was nearly lost to the profession. Students failed to receive instruction in the branches deemed so important in previous years. The result was that neither in private practice nor in college work was the true art of the mechanical dentist taught. A change came with the introduction of crown- and bridge-work, and from that period a return to metal working has become part of the teaching of all well-regulated colleges.

So far from this being confined to the last term of the three years' course, it is believed it is in all, as it certainly is in some of the institutions, continuous throughout the three years, and the student must be dull indeed who could regard his manual training as a farce at the end of his three years' course.

Much is still needed to make our colleges what they should be. The difficulties met with in teaching large bodies of men have not yet been overcome, but we believe that the time is not far distant when the highest present ideal will have been reached. The excellent suggestions given by our colleague and friend will then all have been incorporated in the curriculum.

TO SUBSCRIBERS.

THE periods for new subscriptions for this journal begin January and July of each year. As this is one of the periods, it may be well to inform those not familiar with the custom of this periodical that at the expiration of the subscription, a copy of the first number of the new volume is sent. If this be not returned, it is assumed that it is desired to continue the subscription. Those who wish the JOURNAL stopped should notify the publishers at once; otherwise, they will be expected to meet the bill when presented. A careful attention to this would avoid frequent and unnecessary irritation on the part of those who have neglected a plain business requirement.

NEW WEEKLY JOURNAL.

THE *Dental Tribune*, a newspaper for dentists, issued every Saturday, and edited by Dr. Louis Ottoby, Chicago, Ill., is another candidate for the interest of the profession.

The numbers already issued indicate a determined purpose to make it of value in a general sense. Its size does not warrant the expectation of its being a medium for scientific dental literature, and we do not understand this to be the intention. It will fill a place as a dental news journal, especially at the period of the Columbian Exhibition.

The numbers thus far have been mainly filled with interesting sketches of the men prominent in the organization of the World's Columbian Dental Congress.

The editor has the best wishes of this journal for a successful result as a reward for his earnest and courageous effort.

NEW DENTAL SCHOOL IN NEW YORK.

THE announcement has been made of the establishment of a new College of Dentistry in New York City "for men and women."

It has been a foregone conclusion for some time that New York would have the second school, and it is rather remarkable that this has not been established before.

It starts out on a liberal basis, and for this the incorporators are to be congratulated.

The Faculty has not been announced, but we understand that Dr. W. F. Rehfuss, of Philadelphia, is to have the chair of Dental Jurisprudence. The selection is the best that could have been made, and gives promise of a strong staff of workers in the several departments.

Bibliography.

METHODS OF FILLING TEETH. BY RODRIGUES OTTOLENGUI, M.D.S.
TWO HUNDRED PAGES, WITH TWO HUNDRED AND THIRTY-SIX
ILLUSTRATIONS. S. S. White Dental Manufacturing Company,
Philadelphia. Claudius Ash & Sons, Limited. London, 1892.

The question may be asked, Why another book on the methods of filling teeth, when the processes which give the best results have been described over and over again? The answer may,

perhaps, be found in the fact that new generations of professional workers are coming on the stage yearly, and it may be well from time to time to give them fresh thought on a somewhat thread-bare subject.

The fact must be recognized that it is not always the manipulative skill displayed in a book of this character that is most needed. The influence for a higher ability manifested in its pages and the preservation of procedures which have built up the practice of dentistry in the past will be its greatest value. There has always been a danger that the skill acquired with so much effort in former periods might be lost in the conflict between self-interest on the one hand and indifferent teaching on the other. Hence it must be regarded as by no means waste energy to again present this subject of filling teeth in book form.

The contents have in a measure become familiar to readers of the *Dental Cosmos* through their serial publication in that journal. This plan of introducing a book is certainly not to be commended. While it may give general notoriety, it works ultimately to the injury of the book and places the reader at a disadvantage, for those who peruse the articles as they appear secure but a limited idea of the scope of the work, and may never take the trouble to re-read it. The result is frequently adverse and undeserved criticism.

A connected and careful reading by the reviewer leads to the opinion that in attractive style and thoroughness of description it has no equal in the publications upon this special subject,—that of filling with cohesive gold.

It must be remembered, in judging of this book, that the author makes no pretence to explaining other modes; indeed, he frankly acknowledges that he "has never used non-cohesive gold," therefore criticism is disarmed in this direction. He also states that he has "no broad claims to originality in connection with the methods described."

The style of the book, while attractive, may be an injury to it as a text-book, as there is a certain amount of delving to be done through paragraphs to seek the practical matter important to the beginner.

The author has started out with the idea of exhibiting the modes of doing a certain thing in the best manner possible, and in doing this he has certainly ignored conditions. He makes no account of age, character of tooth-tissue, systemic conditions, temperament of individuals, and the hundred and one things that prove such important factors in the success or failure of an operation.

While this may be well from his stand-point, it is a fatal error when considered from that of the partially-trained man. It is a return, in a measure, to that happily exploded idea, "That whatever is worth filling at all is worth filling with gold."

When the filling of teeth properly seems to be relegated, as at the present time, to enthusiasts, and regarded by the practical money-maker as waste time, it is a satisfaction to find one capable of describing how this should be done to produce the best results without regard to the financial rewards involved.

In considering this book in detail there will be found much to criticise.

It would be interesting to know where the author gets his authority for the assertion that "lead has been used in children's teeth, and occasionally in well-defined cup-shaped cavities in adult mouths." The writer of this review has been fairly conversant with all forms of filling-material, but he has yet to see lead-foil or to know of a case where it has been used. While he would not have it inferred that the author has not seen it, it would have added much to the assertion could he have given the authority for the statement.

The next paragraph, on "Tin," is a surprise, and it must be regretted that the author's prejudices against this material allowed him to make an *absolutely erroneous statement*. He writes, "It has also been made into foil and used as soft or non-cohesive fillings are made. Before the introduction of amalgam, it occupied the same place which that material too often does now,—for the filling of teeth where a high fee could not be charged. Except for this purpose, which is an unprofessional one, it has little value." No one who has used tin, as it should be used, and upon the same principles, so ably laid down by the author on cohesive gold, could so utterly condemn one of the most valuable materials ever placed in the hands of the dentist. No material has ever been more maligned than this, and it is incomprehensible how the author could have allowed himself to so distort the facts in regard to it.

His fling at tin and gold combined is equally unjust, and leads one to fear that his professional walk has been in narrow ways and that a blind adoration for gold has led him to overlook more humble but none the less valuable things. This is not the place to present arguments in favor of these two forms of fillings, but the author may be commended to seek the wisdom that comes by experience before he allows a second edition to contain such a radical error.

As an illustration of the weakness of his reasoning, a quotation is given in regard to the therapeutic action of oxychloride of zinc. "That an oxychloride filling does possess some therapeutic qualities seems indicated by the fact that it may usually be depended upon to lessen the sensitiveness of dentine if left in the cavity a month or more. This, of course, may occur under one of oxyphosphate simply because the tooth itself has altered, but as it has in my observation occurred more frequently with oxychloride, I deem it safe to say that an oxychloride filling has an obtunding effect." It is impossible to believe that the author does not know the rationale of the action of oxychloride in sensitive dentine, and why not say so instead of leaving the whole action involved in doubt?

The argument on page 63, in regard to the relative value of cohesive and non-cohesive gold, is decidedly lacking in force, and will not appeal to the thinking, practical minds who have had experience in all forms of this material. More than this, it seems wrong to mislead young men by such broad assertions. If his argument had been confined to proving that it is better to teach young men *one form of filling*, and that to be confined to cohesive in the first years of college training, no exceptions could be taken by the writer, but to ask the question, "Is there any advantage in non-cohesive gold . . . sufficiently important . . . to deserve a place in office practice?" and then to answer it by asserting, "If there is, I am ignorant of it," shows such a want of true knowledge as to almost throw a doubt over the conclusions arrived at as to the value of cohesive gold.

His argument that a student should be taught to use non-cohesive gold, in order that he may acquire "manual dexterity, which will quickly make him expert in the use of cohesive gold," is, in the opinion of the reviewer, fallacious in the extreme. The entire process of using non-cohesive differs so radically from that of cohesive gold, that he who learns the use of the former will have the greatest difficulty in properly acquiring the latter. The same rule applies to some extent to the use of the cohesive gold, but it has not the same deterring influence.

The author's argument against the V-shaped space, on page 85, will appeal to the contourist, who can see only in one direction, but to the men who lived in the days when these spaces were universal, the assertion that they "induced pyorrhœa" will be received with smiles of incredulity. It was not until long after the introduction of cohesive gold and the necessary adjuncts of rubber dam, liga-

tures, clamps, separators, etc., that we began to hear much of pyorrhœa alveolaris. The older dentists were not familiar with it; indeed, some went so far as to assert that such a pathological condition had no existence, as they had never met with it. The V-shaped spaces did not produce pyorrhœa, nor will the contour filling entirely prevent its development. The author must delve deeper to find a reason for his pathology.

The author very properly magnifies the danger of making "retentions" too near the pulp, but seems to be guilty of inconsistency in dilating upon the value of screws as retainers. The idea entertained by some, and implied by the author, that a drill hole, as a retaining-point made in dentine, involves danger to the pulp, has in the opinion of the reviewer but a small modicum of fact to support it. If these be made with a proper comprehension of the anatomy of the tissue, there is really less danger than from the filling itself, which is more often in closer proximity to the pulp than the artificial opening made could possibly be. There has probably been no one thing in operative dentistry more absurdly talked about than this, and we are glad to notice that our author does not bend entirely to the views held, but can see great virtue in a screw.

The pages from 104 to 170 seem too much of a repetition; certainly the good to be found in them hardly warrants restatement of methods practically described elsewhere.

More space has been given to a notice of this book than is usual to one of its size, but its importance is not to be calculated by pages. While it has been found necessary to call attention to a few blemishes in an otherwise admirable work, it must not be understood that the book as a whole is undervalued. There are books familiar to all readers that indicate epochs of thought and action. The world has recognized these and, while they may not have been welcomed, their influence has been acknowledged. It is with something of this view that the writer has risen from a critical reading of this. The courage which has led one of the younger men to plant his feet firmly upon the best, and only the best, work is not only in itself a cause of congratulation, but deserves something more, for it is a challenge, from a better standard of thought, to those who have made the filling of teeth almost a lost art. It means that the indifferent work so unpleasantly prominent in the last decade must stop and the profession return, if not to cohesive gold, to methods more in harmony with the skill it took many decades to develop.

Hence, while the criticism has been to exhibit some weak places, it must be apparent that no better book could be in the hands of both young and old. To the former it will be instructive, and to the latter an inspiration.

MATERIA MEDICA AND THERAPEUTICS. A MANUAL FOR STUDENTS AND PRACTITIONERS. By L. F. Warner, M.D. Edited by Bern. B. Gallaudet, M.D. Lea Brothers & Co., Philadelphia. HISTOLOGY, PATHOLOGY, AND BACTERIOLOGY. By Bennett S. Beach, M.D. Lea Brothers & Co., Philadelphia.

These two publications belong to the "Students' Quiz Series," but, differing from many of similar character, they have an intrinsic value peculiarly their own. That knowledge can be condensed so as to be made valuable as a means of study requires no argument; but to accomplish this satisfactorily requires talent not possessed by all who attempt it.

This applies especially to the manual on materia medica. The latter subject seems to possess special difficulties for a certain class of students. This is probably due to the mass of material found in the large works confusing to the untrained student, who finds it almost impossible to reduce it to proportions available for study, and, as he must necessarily depend on lectures and books, anything which will teach him how to study is of special value. That this manual accomplishes this must be acknowledged.

The same remark applies to the manual of "Histology, Pathology, and Bacteriology," but these subjects have an interest in themselves not to be found in a manual; but in the same direction of leading the mind directly to the main facts, it possesses a value equally with the preceding book.

Obituary.

DR. ALONZO P. BEALE.

DR. ALONZO P. BEALE died in Germantown, Philadelphia, Pa., January 4, 1893. His health for two years had been a source of great anxiety to his friends, but not until inflammation of the lungs became manifest did they deem the end so near. He leaves a wife, two children, and a host of friends to mourn his early death.

Dr. Beale was born in Philadelphia, February 7, 1857, and was therefore thirty-six years of age. He studied dentistry with his father, and, after taking two full courses at the Pennsylvania College of Dental Surgery, graduated from that institution in March, 1879. For about thirteen years he has been connected with his Alma Mater as Demonstrator of Mechanical Dentistry, giving each year, very acceptably to the Faculty and the class, a course of lectures on Dental Prosthesis, these supplementing the lectures from the chair of Prosthetic Dentistry. As a teacher, Dr. Beale was quiet, unassuming, and thorough, and enjoyed the respect and affection of all with whom he came in contact. Rarely do we have to record the loss of one so young, who leaves so great a blank among his circle of associates.

C. N. P.

At a meeting of the Faculty of the Pennsylvania College of Dental Surgery, held January 9, 1893, the following resolutions were adopted:

Resolved, That in the death of Dr. Alonzo P. Beale, who for thirteen years filled the position of Demonstrator and Lecturer in the Pennsylvania College of Dental Surgery, the Faculty recognizes the loss not only of a teacher of rare ability, but of a man whose admirable personal qualities endeared him to all with whom he was associated.

Resolved, That a formal expression of the heartfelt sympathy of the members of this Faculty be conveyed to the family of their deceased coadjutor, with the assurance that their profound regret at his untimely loss will be fully shared in by every student and alumnus of the institution.

(Signed)

HENRY LEFFMANN,

Secretary of Faculty.

DR. GEORGE ROBERTS.

DR. GEORGE ROBERTS died in Philadelphia, December 14, 1892, of fatty degeneration of the heart. Dr. Roberts was born in Chester County, Pa., in 1824. He began his dental work with Dr. John Anderson, of Kennett Square, Pa. He subsequently removed to Talbotton, Ga., where he remained until the breaking out of the Rebellion. He then returned to Pennsylvania, locating in Philadelphia, and practised with his brother, Dr. Spencer Roberts, for some time; but eventually located in Arch Street, where he remained until his death.

Dr. Roberts never lost his interest in his profession, manifesting this by active work in his local society,—the Odontological Society of Pennsylvania. It was exceedingly rare to find him absent from these monthly gatherings, and when present was always on the side of progress in the Society or profession at large. His activity was not so much in the arena of discussion, but was equally potential for good. His example of constant interest and work has been a strength to his colleagues, and should be an incentive to younger men to work while their day lasts for the advancement of their profession.

He married a daughter of Dr. Anderson at Kennett Square. She survives him, with three sons and one daughter.

Domestic Correspondence.

THE WORLD'S COLUMBIAN DENTAL CONGRESS— CHANGE OF TIME.

TO THE EDITOR OF THE INTERNATIONAL DENTAL JOURNAL:

SIR,—The following communication was received from President Bonney, of the World's Congress Auxiliary, which necessitates a change in the time of meeting, and also a rearrangement of the order of business for the World's Columbian Dental Congress.

"The Dental Congress has been assigned generally to the week commencing Monday, August 14, 1893. The Congresses of Science and Philosophy have been assigned to the week commencing Monday, August 21, 1893. With more than a hundred congresses to provide for, you will readily understand the extraordinary difficulty of making suitable arrangements for each, but the extra provision which has been made for the places of meeting will render practicable arrangements which, under the ordinary circumstances, would be simply impossible. When the congresses were first proposed we expected to have only one large audience-room with a suitable number of smaller halls; but as the World's Congress' work enlarged, the places of meeting were also made more adequate. As the World's Congress Art Palace is now planned, there will be two large audience-rooms capable of accommodating three thousand persons each, and more than twenty smaller halls which will seat

from three hundred to seven hundred persons each ; thus providing for no less than thirty-six large meetings, and three hundred and sixty smaller meetings in a single week, by holding morning, afternoon, and evening sessions. Among the other congresses assigned to be held in parallel with the Dental Congress are those of Pharmacy, Medical Jurisprudence, and Horticulture. For all these the accommodations will be adequate. You understand, of course, that everything in the nature of an exhibit is required by the Exposition authorities to go to Jackson Park. The congresses deal not with things, but with men ; not with matter, but with mind."

In accordance with the above statement the time of meeting will be from Monday, August 14, to Saturday, August 19, inclusive.

Please note this change in your journal.

Yours very truly,

A. O. HUNT.

IOWA CITY, IOWA, January 16, 1893.

CENTRAL DENTAL ASSOCIATION OF NORTHERN NEW JERSEY.

TO THE EDITOR OF THE INTERNATIONAL DENTAL JOURNAL:

SIR,—At a regular bi-monthly meeting of the Central Dental Association of Northern New Jersey, held in Newark, N. J., December 19, 1892, the proceedings were made unusually interesting by the presentation of a handsome gold watch and chain to the Secretary, Dr. Charles A. Meeker. The following remarks were made by Dr. S. C. G. Watkins in presenting the gift:

"MR. PRESIDENT, MEMBERS, AND FRIENDS OF THE CENTRAL DENTAL ASSOCIATION OF NORTHERN NEW JERSEY,—There devolves upon your chairman of the Executive Committee this evening a duty more pleasant than he is often called upon to perform,—that of expressing, as well as he is able, the feeling which the members of this society entertain towards those who have aided them.

"It is not necessary to dwell at this time, however we may be tempted to do so, upon our past history. For something like ten years we have maintained a series of meetings more regular, better attended, and more profitable than has usually been the fate of similar societies. I do not mention this to boast, nor to make invidious distinctions, nor to impress upon any of our good friends,

not members of this Association, that they should feel humble and reverent in our presence,—far from it. I mention the fact because it throws lustre upon a certain name which every member of this Association delights to honor. Such success as we have had has not come by chance, nor because our members are more able, more devoted to their profession, more capable of imparting to others the benefits of their experience, than are dentists in other parts of the country. It is rather because of the skill which has planned our meetings and contrived our entertainments so as to bring here those who could instruct us, and attract those best capable of profiting by such instruction. I shall not ask who has done this, as it might bring a blush upon the cheek of one of our number,—than whom the society does not contain a more modest or a *meeker* man.

“You all doubtless know, moreover, how anxious we have all been to express, in some fitting way, our gratitude to the man who has done so much for us, and how that desire was made possible by our friend Dr. Stockton, who conceived the idea and gave birth to the expression, so that it took practical shape in the purchase of a slight testimonial, to be given him as a tangible evidence of our gratitude.

“This article was selected not by any means because it was deemed necessary to put a watch on the treasurer,—far from that,—but rather that you, sir, may be constantly reminded of this society as you note the flight of time, and by the union of the two thoughts thus made necessary, may never forget the approach of meeting-nights, nor neglect in the future those genial offices you have performed so faithfully and so pleasingly in the past. Please accept this token of appreciation from the members of the Central Dental Association of Northern New Jersey, and may every revolution of its hands around the dial find you well, happy, and prosperous for many years to come.”

Dr. Meeker responded as follows:

“GENTLEMEN AND FRIENDS OF THE CENTRAL DENTAL ASSOCIATION,—This is a most unlooked-for evidence of your esteem. You do not know how I appreciate it. I shall think of the Association much oftener than the opportunities afforded by an occasional glance at this beautiful watch. I want to say that our next meeting in February will be the grandest and most unique meeting ever held in this country. Then many of the most learned and eminent men in the profession will be present to reply to the toasts of the

various States. I need not add that this digression has not made me forget the splendid recognition you have just shown me, and I thank you for it most cordially."

Engraved on the inside of the watch-case is this inscription:

"Presented to Dr. C. A. Meeker by the Central Dental Association of Northern New Jersey, December 19, 1892, as a testimonial of faithful services rendered as treasurer."

On the outside of the case is the doctor's monogram.

After this the meeting was called to order and the regular business of the evening was taken up.

Yours truly,

S. C. G. WATKINS.

PHILADELPHIA COUNTY DENTAL SOCIETY.

PHILADELPHIA, December 14, 1892.

TO THE EDITOR OF THE INTERNATIONAL DENTAL JOURNAL:

SIR,—In the INTERNATIONAL DENTAL JOURNAL for January, 1892, appeared an editorial entitled "A Legal Outrage." This editorial is what it styles the acts of others,—“an open violation of all professional practice” and ethics. It is filled with statements which are unjust and untrue. When the Committee on Enforcement of Law of the Pennsylvania State Dental Society, or the Legal Committee of the Philadelphia County Dental Society, upon whom have been placed the solemn obligations to enforce the laws of the Commonwealth of Pennsylvania, proceeded to the discharge of their duty, their action can hardly be stigmatized as “officious intermeddling of individuals and societies,” or as “tyrannical proceedings.” An examination of the charter of the Philadelphia County Dental Society will show that it is not “modelled after law and order associations,” and that its “sole object” is not “the prosecution of violators of the dental law of Pennsylvania.” The Philadelphia County Dental Society has not for one moment, or in a single instance, “overstepped the bounds laid out for its government.” These and other inaccuracies are embodied in the editorial in question, and it concludes with the serious charge that the gentlemen of these committees have, “under the guise of a public duty, openly violated all professional practice,” and makes a call upon societies “to promptly place such individuals beyond the pale of professional recognition.” The Philadelphia County Dental Society has waited in the hope that your own sense of right would lead you to rectify these misstatements, and they

especially trusted that this would be done after the attention of the Pennsylvania State Dental Society was called to them this summer. The *amende honorable* has not been made, and at a special meeting of the Board of Directors of the Philadelphia County Dental Society, held on December 13, the Secretary was instructed to address this letter to you, and request that you send by return mail the assurance that a suitable apology will be inserted in the next issue of the JOURNAL.

Sincerely yours,

W. A. PHREANER,
Secretary.

1415 WALNUT STREET.

[REMARKS.—We give the "Philadelphia County Dental Society" the benefit of the publication of the above peculiar communication.

We have not heard from the Pennsylvania State Dental Society, but we can assure our correspondent that when that body furnishes this journal with its criticism, it will be received with the respect due such an organization.

Inasmuch as the Philadelphia County Dental Society was not named in the editorial alluded to, and as our views have not undergone any modification by the *lapse of a year*, we see no necessity for a compliance with the demand for an apology.—ED.]

NEW MODE OF USING NITRATE OF SILVER.

TO THE EDITOR OF THE INTERNATIONAL DENTAL JOURNAL:

SIR,—I send you enclosed a piece of blotting-pad which has been saturated with a forty-per-cent. solution of silver nitrate. I have been trying lately numerous experiments to have a form of this caustic which could be applied to children's teeth without the direct application of the crystal, which is always attended with some danger, and liable to stain the fingers, napkins, and instruments.

This preparation seems to work very happily, and is of abundant strength for all purposes required in the mouth, whether for cauterizing the soft tissues or acting on the hard. It is well known that nitrate of silver is very soluble, dissolving in its own weight of water. This strong solution I tried first on some short fibre of cotton, but found, when dried, that the cotton was entirely destroyed. This strength—forty per cent.—is about as strong as it can be used without some destruction of the fabric. The pad, thus prepared,

can be cut into small pieces, and be always ready for use, if it be kept dry.

C. N. PEIRCE.

[REMARKS.—While we have not had an opportunity to test the sample sent, there can be no doubt of its value. It will unquestionably prove a great convenience in the application of nitrate of silver, and our readers, we are sure, will have reason to thank Professor Peirce for its timely introduction.—ED.]

THE ELEVENTH INTERNATIONAL MEDICAL CONGRESS. SECTION OF ODONTOLOGY.

TO THE EDITOR OF THE INTERNATIONAL DENTAL JOURNAL:

SIR,—The Eleventh International Medical Congress will be held in Rome, 1893, beginning the 24th of September and continuing until the 1st of October.

The Committee on Organization, following the precedent established in London, 1881, has provided for a Section of Odontology. As America has contributed pre-eminently to the scientific progress of dental surgery, it is hoped that the dental profession in America will be creditably represented: all reputable practitioners are entitled to membership in that section.

The time chosen is the most delightful of all the year, and to those who have never visited the "Eternal City" the meeting of the Congress will afford a rare opportunity.

The North German Lloyd Steamship Company has an established line of first-class steamers to Genoa, making the passage in less than eleven days. It proposes to reduce the fare to Genoa by twenty per cent., and the return-trip by ten per cent., to those attending the Congress.

The French Railway Company has also offered a reduction of fifty per cent. on its fare.

Dr. Norman W. Kingsley, 115 Madison Avenue, New York, has been appointed Member of the American National Committee for the Promotion of the Interests of the Odontological Section. All communications in reference to that section should be addressed to him.

A. JACOBI, M.D.,

Chairman of the American National Committee.

Current News.

WORLD'S COLUMBIAN DENTAL CONGRESS.

STANDING COMMITTEES.

THE following additions have been made to the Committees of the Congress, and are to be added to the list as published in the INTERNATIONAL DENTAL JOURNAL for June, 1892, page 475:

Committee on Conference.—C. N. Peirce, Philadelphia, Pa.; A. Warner, Jr., San Francisco, Cal.; George H. Cushing, Chicago, Ill.; J. N. Crouse, Chicago, Ill.; W. Herbst, Bremen, Germany; Wm. Jarvie, Brooklyn, N. Y.; R. E. Watkins, Eutaw, Ala.; S. B. Brown, Fort Wayne, Ind.; S. A. Main, New York City, N. Y.; H. A. Smith, Cincinnati, Ohio; C. R. Butler, Cleveland, Ohio; Chas. J. Essig, Philadelphia, Pa.; James Truman, Philadelphia, Pa.; Garrett Newkirk, Chicago, Ill.; A. R. Eaton, Elizabeth, N. J.; W. J. Younger, San Francisco, Cal.; H. M. Hunter, San Antonio, Texas; W. R. Patton, Cologne, Germany; F. H. Balkwill, Plymouth, England; R. T. Stack, Dublin, Ireland; W. B. Pearsall, Dublin, Ireland; Henry Sewill, London, England; B. A. Muckenfuss, Charleston, S. C.; W. E. Magill, Erie, Pa.; C. C. Chittenden, Madison, Wis.; Frank Abbott, New York City, N. Y.; C. E. Francis, New York City, N. Y.; J. L. Williams, Boston, Mass.; E. A. Bogue, New York City, N. Y.; P. G. C. Hunt, Indianapolis, Ind.; J. E. Cravens, Indianapolis, Ind.; E. H. Angle, Minneapolis, Minn.; Ludwig Holländer, Halle, Germany; W. Campbell, Dundee, Scotland; S. B. Cook, Chattanooga, Tenn.; W. T. Arrington, Memphis, Tenn.; B. G. Maercklein, Milwaukee, Wis.; A. W. Nason, Omaha, Neb.; S. J. Barber, Portland, Ore.; C. S. Case, Jackson, Mich.; L. C. Ingersoll, Keokuk, Iowa; Wm. Taft, Cincinnati, Ohio; J. Hayhurst, Lambertville, N. J.; A. O. Rawls, Lexington, Ky.; J. N. Farrar, New York City, N. Y.; E. T. Darby, Philadelphia, Pa.; G. W. Rembert, Natchez, Miss.; Louis Augspath, Little Rock, Ark.; W. G. A. Bonwill, Philadelphia, Pa.; T. B. Welch, Vineland, N. J.; Geo. Watt, Xenia, Ohio; O. E. Hill, Brooklyn, N. Y.; M. Delapierre, Brussels, Belgium; C. Van der Hoeven, Haag, Holland; R. Skogsborg, Stockholm, Sweden; Julius Scheff, Vienna, Austria; Wm. Alfred Hunt, Somersetshire, England; C. F. Rich, Saratoga, N. Y.; Wm. Edward Harding, Shrewsbury, England; James Leslie Fraser, Inverness, Scotland; Julius Parreidt, Leipzig, Germany; Carl Kaas, Christiania, Norway; V. E. Turner, Raleigh, N. C.; A. A. Dillehay, Meridian, Miss.; J. J. Andrew, Belfast, Ireland.

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DR. CHAS. H. TAFT has removed his office from 273 Oakwood Boulevard to 5401 Jefferson Avenue, Chicago, Ill.

RECENT PATENTS.

A LIST of recent patents, reported specially for the INTERNATIONAL DENTAL JOURNAL:

487,647.—Dental Vulcanizer. George B. Snow, Buffalo, N. Y. Filed August 13, 1892.

487,726.—Dental Regulator. Jonathan A. Ellard, Birmingham, Ala. Filed April 15, 1892.

487,843.—Dental Plugger. Henry R. Kline, Ashtabula, Ohio. Filed April 6, 1892.

487,973.—Dental Separator. Benjamin Simons, Charleston, S. C. Filed June 6, 1892.

488,008.—Method of Forming Dental Crowns. Jephtha G. Holingsworth, Kansas City, Mo. Filed April 26, 1892.

Trade-Marks.—22,109.—Liquid Anæsthetic for Dentists' Use. George M. Miller, Detroit, Mich. Filed October 3, 1892. Essential feature, the word "Exhedonic."

SAN FRANCISCO DENTAL ASSOCIATION.

At the regular monthly meeting of the San Francisco Dental Association, held in Mystic Hall, Union Square Building, San Francisco, October 10, 1892, the following officers were elected for the

ensuing year: L. A. Teague, President; C. E. Post, Vice-President; H. P. Carlton, Recording Secretary; William F. Sharp, Corresponding Secretary; W. A. Knowles, Treasurer; C. E. Post, Librarian.

W. F. SHARP,

Corresponding Secretary.

500 SUTTER STREET, SAN FRANCISCO.

Selections.

USE OF IODINE, CARBOLIC ACID, AND CHLORAL IN SKIN DISEASES.

DR. C. W. CUTLER (*Journal of Cutaneous and Genito-Urinary Diseases*) says:

After two years experience in the use of this therapeutic agent, I believe the following conclusions can be safely drawn:

That we have in this combination of chloral, carbolie acid, and tincture of iodine, in equal portions, a topical remedy of decided value for the treatment of certain affections of the skin.

That the combination of these agents produces better results, has a wider range of usefulness, and possesses superior therapeutic advantages than are found in either of the remedies when employed alone.

That the physiological properties of this solution, upon which the therapeutic advantages of the remedy depend, are those of an antiseptic, antipruritic, antiparasitic, antiphlogistic, analgesic, anæsthetic, absorbent, and counter-irritant nature.

That the solution is a powerful agent and should not be used indiscriminately or carelessly, as there is danger of producing severe dermatitis and constitutional poisoning.

That its chief therapeutic advantages are due to its penetrating action into the tissues of the skin, its rapid destruction of all forms of micro-organisms, and its wonderful power in hastening the absorption of inflammatory products.

That it is, therefore, especially serviceable in parasitic skin affections and in all forms of chronic skin diseases characterized by thickening and induration of the skin, accompanied by scaling and itching.

That it changes the form of some skin diseases, substituting for the original disease an acute dermatitis, which responds readily to treatment.—*American Lancet.*

FIG. 1.

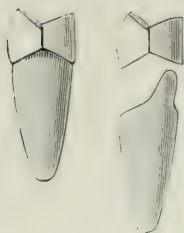


FIG. 2.



FIG. 3.



FIG. 4.



FIG. 5.

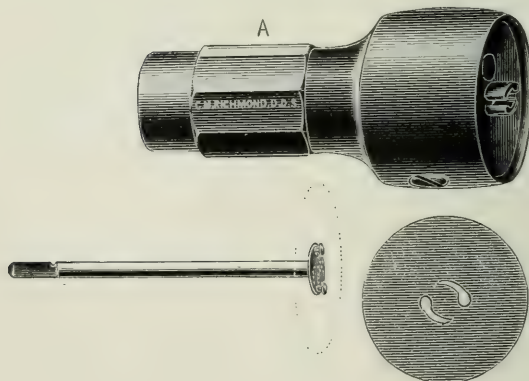
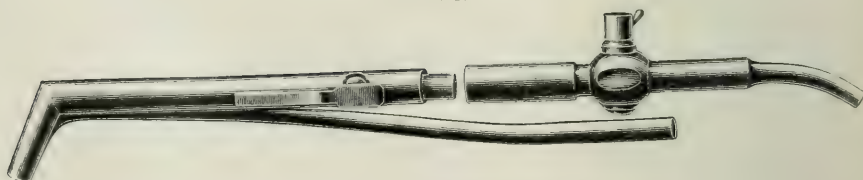


FIG. 6.



THE International Dental Journal.

VOL. XIV.

MARCH, 1893.

No. 3.

Original Communications.¹

CROWN- AND BRIDGE-WORK.²

BY DR. C. M. RICHMOND, NEW YORK.

(Continued from page 86.)

IN the treatment of badly-decayed bicuspidis where the cavities extend from the mesial to the distal surface, leaving the cusps standing and in good condition, I separate with disk to the gum-line and thoroughly excavate. If the pulp be complicated in the case, I remove it and prepare as if for a filling. The next step in the operation is to fill the tooth with hard wax, so that a perfect impression can be taken in plaster for the purpose of getting a fusible metal die of the tooth. A gold band is now carefully fitted to the tooth, letting it extend to the gum-line entirely around the tooth; I cut out the front of the band which covers the facial surface of the tooth so that only a narrow band shows, leaving the band where it passes between the teeth fully up to the cutting-edge of the tooth. The cavity is now dried out, and also the outer surfaces, cement mixed, and the tooth filled with sufficient to leave a surplus, placing some of the cement on the outside surfaces. The band is now thoroughly covered with the cement on the

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inside surface, and placed on the tooth and carried home. After the cement has crystallized the surplus is removed, and we have a tooth that is perfectly protected from any further destructive process.

To further make this operation durable, I place the rubber dam over the teeth and cut out enough of the cement to give anchorage for a gold filling. I now fill from side to side against the gold band, and, when finished, polish as in an ordinary gold filling. This operation is easily performed in one sitting, and where the patient objects to a whole gold crown, or to having the tooth cut off for a crown of porcelain, this furnishes an easy way out of a difficulty.

In Fig. 1 I have illustrated a half-crown for restoring a bicuspid where the buccal surface or cusp has been lost. This crown is shown without a pin or post, as it would be made for a tooth where the nerve is still alive and it is desired to keep it so; the pin or post would be used in combination with the half-band if the pulp had been lost. In making this operation I bevel the broken surface to the gum-line and shape the standing cusp as desired. A plaster impression is then taken of the tooth, as before described. After casting a die of metal, a band is bent and fitted, letting the ends lap where it covers the broken surface of the standing cusp; I solder and fit the half-band as perfectly as if for a whole crown. After fitting it on the standing cusp in the mouth, a small eye-tooth is selected and ground to a bicuspid shape, and the bevel ground to fit the bevelled surface which has been made in grinding root in the mouth. The case is now waxed together and tried on in the mouth; if right, it is invested, and a small piece of solder is all that is required to secure the porcelain to the band where it is lapped and soldered. If the tooth has lost the pulp, I always use a post in combination with the band, thereby securing every advantage to be gained by the combination of band and post. After the case is ready to fasten in position I dry the root thoroughly, and also the band, cementing it into position in the ordinary way. After the cement has crystallized, a portion is removed at the cutting-edge and then thoroughly filled with gold as a protection to the cement. This operation is one of those frequently presented for restoration, and, when nicely done, is beautiful, durable, and always pleases the patient.

In Fig. 2 I show a bicuspid crown with a double porcelain face. I make this operation in cases where the patient objects to showing gold. The procedure is to make a band and bevel the surfaces alike to the gum-line, inside and out. I cut a hole in the cap and

wax the post into position, and invest and solder before I grind the teeth, as it gives something to wax the teeth to, by letting the post extend quite a distance through the top of the gold cap. The teeth are selected and ground into position while the cap is on the root in the mouth. After removing the cap the teeth are backed up and waxed on, and the case is tried in the mouth, and, if found right, the case is invested, leaving the small surface where the two porcelain teeth are waxed together exposed. After the case is cleaned of wax it is heated to the proper point, and a small lump of solder (previously melted into a shot) is placed in position, and as it is brought to the melting-point it will, by its own weight, drop to its place between the porcelains, soldering them together and to the post. When this case is cemented into place on the root, it is ground so that the natural teeth strike first, sufficient to give them the blow before the new one strikes. If this be done in all cases of single crowns less trouble will be had from the breaking off of the porcelain teeth.

I have illustrated in Fig. 3 an instrument devised by me for root-trimming. The cut is twice the size at the cutting part, to have it well engraved. With this instrument the root can be readily shaped as desired, the guard keeping it from reaching or injuring the gum tissues.

Fig. 4 illustrates a helper, as I term it. I use this instrument for trimming roots, cleaning roots, and also for removing bands while fitting them to roots. It is indispensable in crown-work. In separating teeth I use paper disks, as they are flexible and cut just where you want them to. If I have no room to begin, I place a piece of cotton between them for one night, and plenty of room is obtained. I use a disk-carrier, which is illustrated in Fig 5. The time used in changing the disk is reduced to the minimum; the double-surface disk and the single-surface disk are used with this holder, and if I have a case which requires the use of twenty disks in separating or polishing, the whole time would not exceed one minute in changing. In working at crown- and bridge-work the greatest care should be taken to avoid the escape of gas, after laying the blow-pipe down.

I had been suffering from frequent headaches, and found the cause of it was faulty mechanism in my blow-pipe where the rubber tube was used as a means of regulating the flow of gas while the blow-pipe was in use. I discarded all the old devices, and had my mechanic make a pipe with a stop-cock in the shell, so that when I am through I can at once stop all leakage of gas, and I

at once recovered from my headache and have not been troubled since. Any mechanic can do this for you. I have illustrated this device in Fig. 6.

(To be continued.)

UNNECESSARY PAIN IN DENTAL OPERATIONS.¹

BY JAMES A. REILLY, D.M.D.

It is not my intention this evening to attack any established theories or to attempt to overthrow any cherished opinions or prejudices. I simply desire to call your attention to a few points in every-day practice, and would prefer to suggest a few things you ought not to do rather than those you should do. Indeed, I am to address you from the stand-point of a patient in the chair rather than as the operator at its side.

One forenoon during my senior year at the Harvard Dental School, and while in charge of the dental department of the Bennet Street Dispensary, among the numerous patients was a lad of twelve or thirteen years. He went through the usual preliminaries required in order to have an inferior bicuspid tooth extracted. The operator mechanically picked up his mirror and pliers to examine the tooth, or what remained of it, and almost simultaneously with their introduction into the boy's mouth there was a terrific scream and a plunge that almost carried him through the window. An attempt at extraction by a street dentist had resulted in the removal of the crown, leaving the entire coronal portion of the pulp standing unprotected. The dentist simply plunged his pliers into the mass of living tissue. Was not that an abuse utterly reprehensible on his part? I think it was, and so would you, I believe, had you been the sufferer. Yet we are doing just such things every day in one form or another.

That "familiarity breeds contempt" is nowhere more noticeable than in the use of dental instruments and appliances. Not long since, a gentleman somewhat prominent in dental organizations told me he had not a dozen excavators in his possession; that he excavated all his cavities with the aid of the dental engine, and wished to wager me that I could not find a cavity in a tooth that

¹ Read at a meeting of the American Academy of Dental Science held in Boston, December 7, 1892.

he could not reach and prepare as well, if not better, with the engine than it could be accomplished with hand-excavators. Upon being questioned if his patients did not complain of being hurt, he replied, "Confound the patients! my duty is to protect myself." If this gentleman could but be patient and operator at the same time, I have no doubt that he would be easily induced to trade some of his burrs for hand-excavators. Has he not, to say the least, become too "familiar" with his engine? This I consider an extreme case of abuse, for, allowing for a moment that all cavities may be reached (which I do not believe, unless he destroys a vast quantity of sound tooth-substance), the time that is gained by its use is but a trifling compensation for the torture that is thus inflicted on children and excessively nervous adults, and I suppose he has such patients. He may run his engine slowly, use the sharpest burrs and all the obtundents at his command, but does he diminish the loss of tooth-structure thereby, or reduce the inherent antipathy to dental operations which the average patient has? Does he not absolutely destroy the last vestige of confidence the little one may possess who has been beguiled into the chair by its parent with the unqualified assurance that "it will not hurt a bit"?

Another appurtenance, no less barbarous in some of the details than the untimely use of the dental engine, is the rubber dam. A prominent writer says, if it is at all difficult to apply, the rubber dam should not be used in the cases of the very young, very sensitive, or very nervous patients. How many of us draw the line at these classes? It is not my intention to point out the occasions for its use or to urge upon you its abandonment, for I consider it a *sine qua non* to good results in numberless cases. But I would like to call your attention to the contempt for your patients' feelings that a "familiarity" with its application breeds.

You are all aware how quickly you jerk your head away if by accident the floss slips too rapidly between your own teeth and burrows itself in your gums while you are cleansing them. How often the same thing is perpetuated on your patients, and nothing thought of it, by you at least, while you are laying coil after coil of cable on teeth that oftentimes do not require ligatures! Frequently, indeed, they serve only to obstruct access to the cavity. We all know, or should know, that with holes of proper size and shape in the dam the employment of ligatures is necessary only in a limited number of cases, provided the tartar has been removed from about the margins of the gum. But for pure, unalloyed torture, permit me to present to your consideration a clamp and an awkward

or heavy-handed operator, and I think there are a few such in the profession.

I speak from experience, for it once fell to my lot to sit in the chair with a clamp on an inferior wisdom-tooth, compelling me to keep open house during the space of three and one-half hours. My knowledge now teaches me that it was entirely unnecessary, and that the cavity might have been filled, with the aid of napkins, in less time than it took to get the rubber and clamp adjusted, and with infinitely less pain and discomfort.

Now, I do not maintain that the clamp should be relegated into "innocuous desuetude," but I do say that extreme care should be exercised in selecting the proper ones to be used in each particular case, so that they may be easily adjusted, and that the most delicate and extreme accuracy of manipulation possible be employed while placing them upon the teeth. I know of nothing more repellant to the average patient than the rubber dam and its accompaniments; therefore I think it behooves us to manifest a little compassion by dispensing with the use of the clamp, or the ligature, and even the dam itself, whenever it is practicable.

Another medium for pain-culture, and one which gives ample opportunity for the application of all the reserve abuse we may have stored away, is obtained during a course of regulating. A great deal of pain and soreness of course, it is needless for me to say, is unavoidable while moving the teeth about, but there is also a large amount carelessly inflicted by over-anxious operators, too eager to accomplish in one day what should take a week, and again, doing to-day what they must undo to-morrow.

I once saw a case of regulating that was worthy of the attention of the society for the suppression of cruelty to children. The teeth were very much displaced, and appliances were adjusted to almost all the teeth simultaneously. Too much force was applied, and too long an interval allowed to elapse before changing, so that when I saw the mouth there was scarcely a tooth in the superior maxilla that could not have been easily removed with the fingers. For articulation the patient could not bring the teeth together without suffering intense pain. And all this under the direction of a reputed skilful operator. The effect of such operations is most pernicious, for the impression they produce on the patient's mind is often more enduring than what they effect in the physiognomy, and frequently nothing short of an exposed pulp will permit further dental operations during those years when the closest scrutiny and care should be exercised.

This, then, is the point I wish to make regarding the lack of care to avoid pain during regulating: that oftentimes nothing is gained by the operation, because if you succeed in holding your young patient's interest to a successful termination of the work you have also generated mentally such an intense dread and abhorrence of you and your benefactions, that it is not until caries has obtained a firm foothold, and sometimes even demolished that which for months engaged all your energies to perfect and beautify, that your ministrations are again solicited. Would it not be more preferable to "make haste more slowly," and retain the confidence of the little ones, even at the cost of not accomplishing quite as much as you would wish to do at that time? This same principle is equally applicable to the filling of young teeth, and I frequently do nothing more at the first sitting than to cleanse a few teeth with the stick, or wipe out a cavity with an antiseptic and insert a little gutta-percha or cement, sometimes without removing any decay whatever. For I consider my time well employed if I can succeed in dispelling this dread which always possesses them at the first sitting.

There are many minor things in our routine work that might be dilated upon in a paper of this kind which are really painful, although to us they seem very trifling, and if our patients shrink from them we are prone to ascribe it to fear or timidity, when we really are inflicting pain. By the habits of some dentists one would suppose the patient had no rights that the dentist should respect. He lolls over and leans on his patient, making of their head a cushion and support for his arm till the patient is well-nigh exhausted. It does not diminish the discomfort any to know that it is sometimes done unconsciously. That much inconvenience and unnecessary pain are caused by our neglect to scrutinize our processes and individual peculiarities, or by failure to keep them before our eyes, is not to be denied. Is not unnecessary pain frequently caused while putting on gold caps, bridges, and collars for crowns, without first applying cocaine to the gum margin? Is it not unnecessary pain to continue nibbling at an exposed pulp that had not wholly succumbed to the arsenious paste? I think you will agree with me that to catch the lip beneath the thumb while making it a fulcrum against the teeth is rather painful, and that to wash out a cavity with cold instead of tepid water may produce avoidable pain.

How common an experience it is to hear an outcry, or see a twitching of the head and body immediately upon using the chip-blower while excavating! It does not take place so much if we use warm air. Yet, do we always use it? Is it not positively

abusive to whack away at a tooth for hours with the automatic mallet, when hand-pluggers might be used with so much more comfort, at least during the first part of the filling? Is it not an abuse to inflict quick wedging as ordinarily performed? Is it not an abuse, in taking full impressions for artificial dentures, to overflow the plaster from your impression-cup into the throat of your patient, when a smaller quantity would produce a much better result by giving a more accurate impression, because the parts are not so likely to be disturbed by retching and coughing? Is it not abusive for a dentist having a strong, muscular hand, with a heavy touch and a vise-like grip, to rush and hurry through his work as if he were under the impulse of electricity? My observations lead me to believe that rapid operators hurt more than slow ones. I believe that after a fair rate of speed has been attained, any acceleration of it is obtained only at the expense of delicacy of touch and of the patient's nervous system.

The conclusions I drew from my experience as a patient was, that more pain and discomfort arose from outside influences, if I may so term them, than from the actual preparation of the tooth to be filled. It is within the ability of everybody to cultivate a delicacy of manipulation, if they do not naturally possess it, and delicate manipulation is a powerful factor in dispelling the dread so universal in the minds of the people relative to dentistry. As President Elliot said the other day at the meeting in behalf of Harvard's new dental school, "It is the dread of pain which makes people miserable."

THE TREATMENT OF PUTRESCENT PULPS.¹

BY DR. ARTHUR L. SWIFT, NEW YORK.

THE subject assigned for this paper, "The Treatment of Putrescent Pulps," is one which has been largely written upon, and the many methods of treatment and numerous drugs employed are as familiar to us all as is the fragrance of sulphuretted hydrogen, the invariable accompaniment; hence it is not the intention of the writer to burden you with a general discussion of such well-known methods, or with the consideration of their respective merits, but

¹ Read before the Central Dental Association of Northern New Jersey, December 19, 1892.

simply to describe what has proved the most successful method in his practice.

I have long since discarded the use in pulp-canals of coagulants, such as carbolic acid, creosote, etc., upon the theory that the coagulum dams up the tubuli and thus prevents diffused medication and thorough disinfection, and instead employ the diffusible essential oils, such as eucalyptus, eugenol, oil of cassia, myrtol, etc., which are very diffusible, carrying large quantities of oxygen and depositing volatile camphors, which are all-powerful in the destruction of septic and infectious matter.

Oxygen stored up in the tubuli aids by its bleaching qualities in retaining the natural color of the tooth, and the non-irritating effects of these oils, with their gentle stimulating action, marked diffusibility, and powerful disinfectant properties, make them especially valuable in these putrescent and inflamed conditions.

In this the age of antiseptic surgery, it behooves us to use every possible aseptic precaution; consequently, care should always be taken from first to last to exclude all saliva, and no instruments should be used which have not been thoroughly sterilized. Having gained free access to the pulp-chamber, wipe out the cavity with cotton saturated with equal parts of peroxide of hydrogen and bichloride of mercury, 1 to 1000, and carefully remove the contents of the canal so as to avoid penetrating the apex, or forcing any septic matter through it; then wipe out the canal with cotton on a broach, saturated with peroxide of hydrogen and bichloride solution, and dry thoroughly with bibulous paper or cotton, followed by use of hot air, and pump into the canal oil of cassia, eugenol, or myrtol, and insert very loosely a whisp of cotton or floss silk saturated with oil of cassia, and seal with gutta-percha, perforating the filling, and if periosteal inflammation exists, paint the gums with saturated tincture of aconite and iodine, and dismiss the case for three or four days. When next seen remove the dressing and pump eucalyptol or myrtol freely into the canal with cotton on a broach, and follow with a dressing of cotton or silk saturated with eucalyptol packed tightly and sealed with gutta-percha without perforation, and dismiss for about ten days. When next seen the canal will be in good condition for filling. Then treat as when last seen, pumping eucalyptol or myrtol, or equal parts of both, into the canal; and after thoroughly drying fill the canal with oxychloride or chloro-percha.

In case of blind abscess, drain the abscess thoroughly by frequent wipings of peroxide of hydrogen and bichloride solution, and inject without pressure oil of cassia, or equal parts of cassia and eu-

eucalyptol, and insert a whisp of cotton saturated with the above very loosely, not closing apex, and seal with gutta-percha and perforate, painting gums with tincture of aconite and iodine. Examine it again in about four days and treat as before, packing dressing, saturated with eucalyptol or myrtol, and seal tightly; and if after ten days tooth is not sore to percussion, fill the canal. If, after having opened into the canal, pain and inflammation continue for some time without abatement, I have found it successful to open into the apical space with a small trephine, which causes very little pain with the use of local anæsthetics, and treat with peroxide and bichloride solution, injecting eucalyptol or myrtol, placing a tent of cotton moistened with oil of cassia in the opening, and treating the canal as before.

In case of abscess with fistula, syringe through it, and inject oil of cassia or eugenol through the canal until it comes out at the opening; dress as before with cassia or eugenol, putting a tent of cotton in the fistula saturated with cassia, and seal with Fowler's stopping or gutta-percha and perforate. Examine it in two days; treat the canal as before, and pack tightly a dressing of eucalyptol or myrtol; seal without perforation. Examine further in two days, and then pump eucalyptol into the canal; dry and fill the canal, and treat the fistula with cassia, and examine it occasionally until healed.

If after filling roots in any of the conditions described trouble should subsequently occur, which has not been the case in the writer's practice during a period of about six years, a trephine should be used, opening into apical space, and treating through the opening, upon the theory that the tooth having been thoroughly disinfected and filled, the trouble must be simply an apical pericementitis, caused by some septic matter having found its way beyond the apex, and by gaining direct access to the apical space the cause of trouble may be removed.

GOLD AND AMALGAM AS A BASIS FOR FILLING.

BY DR. W. F. SIMONTON, CAMERON, W. VA.

APPROXIMAL cavities of molars and bicuspid give more trouble, and the fillings fail oftener, than any other class. The following method of treating approximal cavities of molars and bicuspid has given me better results than any other. It is, or might be called, a

modification of the method of filling partly with amalgam, and letting it harden, and finishing the filling with gold at a future sitting, or of Dr. Clapp's method,—of finishing all at one sitting.

Let us consider, for instance, a distal cavity in the first molar, and a mesial cavity in the second, perhaps as difficult an operation of the kind as any dentist will be called upon to perform. First, secure sufficient space by pressure or cutting, or both, but this must be obtained to allow the operator to see all parts to be operated upon. Prepare the cavity by cutting back the walls, if possible, until some enamel is reached, especial attention being given to the lower or cervical wall; cut it down until it is smooth and strong, with an abutment of dentine back of it, and do this even if it carries the cervical wall below the gum margin, and do not trust, if it can at all be avoided, a thin bevelled cervical wall. Cut a retaining-groove across the cervical wall or bottom of the cavity, letting it extend up the sides out through the coronal enamel, if a coronal opening has been given to it. At the ends of the groove across the floor, where it turns up the sides, make the angles somewhat acute or with slight pits; and the groove across the floor should be far enough from the enamel to leave standing a small abutment of dentine between the groove and the enamel. Prepare a small piece of amalgam, well washed with alcohol and pressed dry with pliers, and place in the cavity, to fill or nearly fill the retaining-groove, but be careful to keep the amalgam back from the enamel or outer edge of cavity at the cervical border. Now place on the amalgam small pieces of gold, not pellets, but foil folded and cut in very small squares. I use Williams's crystalloid, No. 3, cut in pieces a line or less square, or small bits of Stuerer's or Watt's crystal. Press these first pieces down lightly, using a small instrument, and applying it all over the gold; and soon the mercury will show through the gold; then apply more gold, letting it extend to and beyond the cervical edge of the cavity.

It may be well here to diverge somewhat to speak of cavities where it is impossible to leave an abutment of dentine at the bottom, because the dentine may be decayed below perfect enamel, and the decay extend out to the enamel at the cervical wall. This will give a pocket- or pouch-shaped space alongside the enamel at the cervical border. If so, be careful not to fill this pocket full of amalgam, the idea being to have only enough to furnish mercury to amalgamate the first few layers of gold next the cervical border. After the mercury ceases to show through, press the gold down firmly, packing it in the angles or pits at end of lower retaining-groove,

which will be found to hold this part of the filling securely. The filling will now be about the eighth of an inch above the cervical wall, and firmly held by the ends of the retaining-groove. Proceed now to condense and finish, first using pressure by means of a bur-nisher or any suitable instrument, afterwards the mallet, if thought necessary; but pressure is generally sufficient, and it avoids danger of shattering or crumbling this wall. Start the filling in both cavities before completing either, but commence the filling in the distal cavity, as it is more convenient, and complete the filling in the mesial cavity first, as a portion of the front teeth being removed gives much better access to the mesial cavity and also admits the light, while if the mesial filling is completed and partly finished, it acts as a reflector on the distal cavity, and makes it much lighter during the filling.

By following this method and not using any matrix, we get an amalgam or substance for filling the cervical portion of the cavity that is soft and tough and easily adapted to the enamel edge. Be sure that this important part of the work must be well done, and no overlapping of the filling left at the cervical wall. This opportunity to finish will be more appreciated by recollecting the difficulty at the cervical border, where the teeth are long, or the filling extends to or under the margin of the gum, or the neck of the tooth is small, and that portion of the tooth next the gum slopes from a large coronal surface to meet a narrow neck. In short, the method tries, at least, to take into consideration the fact that these fillings almost always fail first at the cervical border, and are also most difficult to make properly here. The use of the matrix cuts off all light at the cervical border. The enamel may be injured by the first few blows of the mallet, or a small portion be scaled off, but the operator knows nothing or little of this after the filling is commenced.

If it be desired, a matrix may at this point be applied for finishing the filling. This method of starting a filling and of finishing the cervical portion is often useful in approximal cavities of incisors, whether there be only one or two fillings that face each other; it is often an excellent plan to put in the cervical part of the filling and at least roughly trim off the surplus gold, as we get much better access to and can see the cervical part more clearly before the main body of the filling is inserted.

Reports of Society Meetings.

AMERICAN DENTAL ASSOCIATION.

(Continued from page 118.)

Third Day.—Morning Session.

THE President called for a discussion on the report of Section III., Operative Dentistry, and there being none, the Section was passed.

Section IV., Histology and Microscopy, was called, and, there being no response, was passed temporarily.

SECTION V.

MATERIA MEDICA AND THERAPEUTICS.

Dr. Harlan, chairman of the Section, reports that it has two papers to present,—one by the secretary and one by the chairman. The secretary, Dr. Hunt, then read his report, as follows:

“The past year has been one of activity to the dental therapist. Antisepsis and anæsthesia are the two subjects receiving special attention.

“ PENTAL.

“Pental, an old compound with a new name, has been recently introduced as a general anæsthetic, and a considerable degree of success has attended its use. Pental is a colorless, highly inflammable, very volatile liquid, soluble in alcohol, ether, and chloroform, but insoluble in water. Unlike sulphuric ether, it is absolutely non-irritant to the mucous membrane of the mouth and respiratory passages, and its exhibition is unattended by nausea, or by a stage of exhilaration and muscular activity. Spasmodic contractions of the muscles of mastication seldom occur, and will readily yield to a further administration of the drug when they do take place. Anæsthesia is produced as rapidly as with nitrous oxide, but the action is more prolonged, and the patient may be kept under the influence for an extent of time sufficient to admit of any of the major surgical operations being performed. The regaining of con-

sciousness is gradual, and the recovery rapid and complete. Full anæsthesia is induced in from three to five minutes, narcosis lasting four or five minutes.

"Pental may be administered in the same manner as ether, but its extreme volatility is better overcome by the use of a modified form of Junker's inhaler, lessening the time of producing narcosis, as well as the amount of the drug used. This latter is an item to be considered, inasmuch as the present price of the compound (six dollars for two pounds eight ounces) renders it rather an expensive article of the *materia medica*.

"As yet, there have been no alarming symptoms reported from the use of pental on man; but as eminent a therapist as H. C. Wood, M.D., has recently declared, after making a few experiments by inhalation, and by injection into the veins of dogs, that, in his judgment, pental is a dangerous anæsthetic, more so than chloroform, and that, if extensively used, it will produce death by cardiac arrest. Dr. Wood further states that he believes the after-effects of pental on the human being would be disagreeable, a statement directly opposed to the evidence submitted by Dr. Hollander, of Berlin, from whose paper on this subject the major portion of this report is derived.

"Dr. Wood did not produce death from the use of pental, but in one case, under the lethal dose of two grammes, injected into the jugular vein of a dog, the effect on the beast was very alarming, the action of that organ being completely arrested a half-minute before the cessation of respiration.

"In view of these experiments, it would be well to use pental with great caution until the physiological effects of the drug are more definitely determined than they are at present. Further investigation of this subject is now progressing.

"CHLORIDE OF ETHYL.

"Chloride of ethyl has proven itself a local obtundent of considerable worth. For minor surgical operations, such as opening abscesses, lancing boils, extracting teeth, etc., it is admirably adapted, and it also has an appreciable value as an obtundent of sensitive dentine, but in this latter capacity must be used with sufficient caution to protect the pulp from deleterious effects.

"Chloride of ethyl is, at present, put up in ten-gramme flasks. Tubes of one-half the size would be amply large for most of the cases in which we wish to employ the drug. Five grammes are sufficient for the extraction of from one to four teeth, or for any

other short minor surgical operation. The extreme volatility of the ethyl renders difficult any attempt to save a portion of the liquid for future use after the neck of the flask has been broken, especially in offices where extracting teeth and lancing abscesses are not daily occurrences. According to recent experiments by Dr. H. C. Wood, chloride of ethyl is a dangerous agent, unsafe and difficult of administration, owing to its extreme fugaciousness.

“ARISTOL.

“Aristol, a combination of iodine and thymol, has now been before the dental profession about eighteen months. To Dr. W. H. Whitslar, of Cleveland, Ohio, is due the credit of first calling our attention to the value of this new antiseptic. Aristol is designed to take the place of iodoform, iodol, and sozo-iodol. It is almost odorless, and is perfectly non-irritant. It is in the form of a reddish- or salmon-colored powder, insoluble in water, slightly soluble in alcohol, and freely soluble in ether and chloroform. The chemical combination is readily broken up, liberating iodine and thymol, and to this feature of its composition is due its antiseptic action. Aristol may be used in connection with chloro-percha for root-canal fillings, and, dissolved in chloroform in the proportion of sixty grains to the half-ounce, it makes a dressing that may be used in root-canals, or as a protective and antiseptic over excoriations of the skin. The powder may be dusted in gangrenous pulps with a fine brush. An excellent root-canal dressing may be made by rubbing up a grain of aristol in ten or twelve minims of one of the essential oils, to which may be added two or three drops of ether or chloroform to facilitate the process.

“Small rods composed of cocoa-butter and aristol, in the proportion of ten to one, are recommended for use in fistulous tracts. Aristol should be kept in well-soldered, dark-colored bottles, and bought in small quantities to insure freshness, as it deteriorates on exposure to light and air.

“ARGENTI NITRAS (SILVER NITRATE).

“The use of silver nitrate for the arrest of decay, although not a new feature in dental therapeutics, has recently received additional attention, owing to the experiments made and results achieved by Dr. E. A. Stebbins, of Shelburne Falls, Massachusetts. In the deciduous teeth, or in the adult molars, where imperfection in the formation of enamel has resulted in superficial decay, and especially in those long, narrow, sensitive cervical cavities so fre-

quently met with, it may be advantageously employed. In cases of approximal decay in the anterior deciduous teeth, the Arthur method of V-shaped separation may be used to produce a saucer-shaped cavity, and after cutting away the comparatively good tooth-substance, a thorough application of the silver nitrate will prevent a recurrence of caries. A serious and ever-present objection to the use of silver nitrate is the blackness of the cavity after its application; but in the deciduous teeth this drawback is more than counterbalanced by its ease of application and the subsequent freedom from decay.

"BICHLORIDE OF MERCURY.

"The following is an abstract from a thesis entitled 'Corrosive Sublimate as a Germicide,' by Charles T. McClintock, A.M., assistant to the Professor of Hygiene in the University of Michigan. The conclusions arrived at are so totally opposed to all past teachings that it is offered here without comment:

"In 1881 Koch recommended corrosive sublimate as the most efficient of all known substances for disinfecting purposes. Since that time it has been universally used. After making some hundreds of experiments, the author finds that Koch, and those who have confirmed his work, base their conclusions on faulty experiments, the most important of which was the failure to notice that the sublimate formed with the gelatinous coat of bacteria a compound insoluble in water, but soluble in salines, and readily removed by the blood. When bacteria treated with sublimate were transferred to gelatin or agar, the capsule of mercury prevented the growth of the germ, and the false conclusion was drawn that it was dead. In the author's experiments this capsule of mercury was removed by precipitation with hydrogen sulphide.

"While Koch states that the bacteria are killed in a few minutes by solutions of sublimate, 1 to 1000, experiments show that bacteria such as *staphylococcus pyogenes aureus* may grow after having been in the 1 to 1000 solution ninety-three hours, 1 to 100 eleven hours, and a saturated solution one hour. *Bacillus subtilis* grew after lying in 1 to 100 forty-one hours, saturated solution eighty-five minutes. Typhoid germs in 1 to 1000 one hour, germs in faeces after twenty-four hours in saturated solution. Several experiments comparing strong vinegar with 1 to 1000 sublimate show that they have about the same germicidal powers.

"The experiments also indicate that a larger number of bacteria in a given culture are comparatively easily killed, and that

the ratio of those killed by a germicide to those that survive is of no value. The conclusions drawn from the experiments are:

“1. That the high rank heretofore given corrosive sublimate as a germicide is without warrant, and was based on faulty experiments.

“2. Different cultures of the same germ may vary largely in their resistance to germicidal agents.

“3. Corrosive sublimate forms with cellulose, with albuminous bodies, and with some parts of bacteria a compound that cannot be removed without washing. When acting on a germ, it forms a capsule around a germ, which protects it from the further action of the germicide, and in turn prevents the growth of the germ, unless removed; but this capsule may be removed by the salines, as in the blood. The action of sublimate on bacteria is probably closely analogous to that of alcohol, etc.

“4. The presence of a gelatinous substance in many, if not all, bacteria has not received due attention from writers on this subject.

“5. In albuminous fluids, and practically all disinfection has to do with such, corrosive sublimate of any strength whatever is not a reliable germicide.

“6. While sublimate has no great germicidal powers, it does not follow that it may not be a valuable disinfectant. This point remains to be proved.

“It may be well in this connection to call attention to the fact that the author of the foregoing fails to mention that Laplace long since wrote of the coagulating influence of bichloride on albumen, and demonstrated that the use of a solution acidulated with ether, hydrochloric, tartaric, or even carbolic acid, was not followed by that result.

Dr. Harlan then read the following paper, entitled

EUROPHEN.

One of the more recent products of the present activity in the world of research is europhen.

Dr. Harlan quoted from F. Goldman the process of producing europhen. Isobutylcresol is first obtained by the action of isobutyl-alcohol upon *o*-cresol in the presence of chloride of zinc at an elevated temperature. This in aqueous solution is acted upon by iodine in iodide of potassium. Instead of using iodine as such, iodine compounds may be employed, from which the iodine is liber-

ated by oxidizing agents like chloride of lime. The iodine compound arising from this reaction is isobutylorthoeresoliodide, or europen, an amorphous, yellow precipitate, which, separated by filtration and cleansed by washing, is dried at an ordinary temperature, with the exclusion of light.

By analysis, the percentage of iodine (according to a series of determinations made under similar conditions by the method of Carius) was found to average 27.6, which corresponds pretty accurately to the proportion of one atom of iodine to two molecules of isobutylcresol.

Europen is a yellow, amorphous powder, resinous to the touch, which adheres tenaciously to the mucous membrane, to wounds, and to the unbroken skin. It has a specific, aromatic odor, which reminds us a little of one of its components, *o*-cresol; perhaps, also, of saffron. The iodized phenols, too, which are produced from the above-named alcohols, differ little from europen as to their aroma. The odor becomes apparent only when europen is used as such,—*i.e.*, as an unmixed powder. It vanishes almost completely in a mixture or solution.

In reference to solubility europen has extraordinary advantages. While it is insoluble in water and glycerin, it is easily soluble in alcohol, ether, chloroform, and such compounds of these as collodion and traumaticine, or liquid gutta-percha. As with aristol, the easy solubility of this iodine product in fatty oils is also worthy of notice. We may by rubbing at a low temperature readily produce a twenty-five-per-cent. solution in olive oil. This should be filtered. In alcohol (thirty-per-cent.) it is easily soluble, as also in an equal weight of ether or chloroform. A small precipitate, which forms not only in the oily solution, but also in alcohol, ether, and chloroform, consists of an organic iodine compound, soluble in water and insoluble in the above-named menstrua. A filtered solution in oil remains clear for a long time. It has been proved that neither a ten-per-cent. nor a twenty-five-per-cent. solution gives a precipitate after being kept for more than three months.

If a filtered solution of europen in oil is shaken with water, the formation of this iodine compound can be seen for days, as with the undissolved powder. What has been said of the vegetable fat (as olive oil) applies equally to ointments prepared with animal or mineral fats (adeps, lanolin, vaselin).

The supposition appears justifiable that europen in contact with water (wound secretions) gives off slowly small quantities of iodine, which are immediately combined again, and thereby form

the soluble compound. Perhaps the chief part of the action of euprophen is to be ascribed to this formation in the nascent state.

The intermediate occurrence of free iodine can be shown by bringing euprophen, which has become free from iodine by long digesting with starch solution, after washing and while yet moist, into intimate contact with starch solution (not the starch solution of the German Pharmacopœia, but resulting from boiling amylum with water), and leaving the mixture upon the filter itself till the moisture has evaporated. By this means the residue becomes blue, as also does the filter. If we wash it anew with water, the filtrate also will be turned blue. That part of the filter which was most exposed to the light shows a correspondingly stronger iodine blue, in consequence of the affinity of iodine for starch, before the formation of the soluble iodine compound.

There must, therefore, be present in euprophen extremely small amounts of free iodine, which form during the drying, and cannot be removed from the product. The percentage is so small that the trace of iodine need not be considered. From ten examinations I compute it on the average at 0.03 per cent.

Euprophen is an easily decomposable substance. Therefore, in applying it, certain precautions must be taken. The solution in alcohol slowly gives off small amounts of iodine, which increase with time. In ether the liberation is somewhat greater. If euprophen is mixed with fats combined with starch, decomposition occurs, which increases hourly, until finally the paste has assumed a blue-black color. This occurs more rapidly if a few drops of water are added. Therefore all mixtures which contain starch, as, for example, zinc, amylum paste, are to be avoided. On the other hand, euprophen conducts itself quite indifferently to talcum, and the practitioner can avail himself of this substance in cases in which a paste of thick consistency is indicated. Mixtures with metallic oxides (zinc oxide, mercuric oxide) and the salts of mercury are to be avoided. On the other hand, simple mixtures with fats, such as vaseline or lanolin, are very durable. Mixtures with lanolin are especially to be recommended, as this substance takes up a large amount of water and favors a continuous formation of the soluble iodine compound.

The solution in alcohol-ether is most used for the preparation of euprophen bandages. In its preparation rapid manipulation is a necessity on account of the already mentioned easy liberation of iodine, the amount of which increases with the time employed. For the preparation of vaginal and other suppositories, it is advan-

tageous to dissolve the europhen in some almond oil, and then rub with oil of cocoa. The solution in alcohol or ether, with a partial or complete evaporation of the menstruum, is, on the contrary, unreliable. All solutions should be prepared at a low temperature. Warming causes a transposition and decomposition of the preparation. Europhen must be protected from the light and kept in a dry place.

Finally, we will add another observation, which concerns the volume of europhen as compared to other substitutes for iodoform. If we regard the specific gravity of europhen as 5, that of sozo-iodol is 7.5, of iodol 10, of iodoform 26,—*i.e.*, europhen is five times lighter than iodoform, and five times as large a wound surface can be covered with it as with the same weight of iodoform,—a fact of no small importance. Then the fine iodoform powder cakes very easily, a disadvantage which does not occur with europhen. If europhen is to be a substitute for iodoform, it must possess, in the first degree, the proper anti-bacterial properties. The very thorough investigation by Siebel in reference to this has proved that it is able to exert the same influence as iodoform upon bacteria in cultures on artificial media. Neither europhen nor iodoform destroys the micro-organisms, but simply makes the medium unsuitable for the growth of the bacteria, and thereby hinders the formation of the products of decomposition. It was also established with certainty by further trials that its influence upon the growth of bacteria does not depend upon a mechanical, but upon a chemical action.

The conduct of europhen towards bacteria outside of the organism harmonizes with the results achieved in therapy, and these correspond completely to the claims as to its effects which have been hitherto made for iodoform.

Furthermore, europhen not infrequently proves efficacious in cases where iodoform has been refractory. Europhen has also the advantage over iodoform of a relative freedom from odor and the absence of toxic effects. Its low specific gravity is also worthy of mention. This renders it possible to insufflate as large a wound surface with one part of europhen as with five parts of iodoform, and with equal effect.

Europhen is one of the lightest of the substances forming its group, having two-thirds of the specific gravity of sozo-iodol, half that of iodol, and less than a fifth of that of iodoform, so that a given surface would require five times as much iodoform as europhen to cover it. The latter has also the additional advantage

of not caking so easily as the former. Ointments and solutions of euophen must be prepared cold, and solutions require filtration, as an insoluble iodine compound tends to form, which sometimes causes them to assume a gelatinous consistency. Euophen is not poisonous. Half a drachm or more can be given to a dog with impunity. In the human subject, fifteen grains produce no disagreeable symptoms, except perhaps a slight feeling of weight in the stomach.

Dr. Eichhoff has prescribed it with great advantage in several venereal and syphilitic cases, obtaining very satisfactory results, in both soft and hard chancres, in mucous patches, and in tertiary ulceration, by means of one or two per cent. ointment. Excellent results were obtained by the application of euophen to simple ulcers, either in the form of powder or in that of ointment. In general, it was found that euophen acts only when brought in contact with secreting surfaces, whereby it is decomposed and iodine liberated. As exposure to light decomposes euophen, as it does aristol, it is important that these substances should be kept in dark-glass bottles. Bacteriological experiments have been carried out by Dr. Siebel, who finds that euophen has destructive power for micro-organisms quite equal to that of iodoform. (*Lancet*, August 29, 1891.)

Euophen when applied in powder to gingival inflammations, produced by the setting of crowns and bridges, promptly and efficiently reduces the swelling and soreness in two days. When it is applied to mucous patches of the cheek or tongue of syphilitic origin, it is equally efficacious, as I have had abundant opportunity to demonstrate in my own practice.

Applied to a suppurating or an inflamed pulp, it promptly subdues the pain incident to such condition. I apply it in powder or rubbed up with lanolin. In the proportion I use twenty-five parts of euophen to seventy-five parts of lanolin. This is also a very neat way to use euophen in excoriations around the corners of the mouth or the nose. As an agent for inflamed sore mouth under metallic or rubber plates, the lanolin paste is exceedingly desirable. It may be used as an after-dressing in pyorrhœa pockets as long as it is desired to secure the benefits from the liberation of iodine.

Your attention is earnestly recommended to euophen as a parasiticide, where such agents may be required. It is barely possible that it should be extremely useful as a dry dressing in empyæmia of the antrum, but I have not as yet used it for that purpose.

ACIDUM CHLOROCITICUM (TRICHLORACETIC ACID, $C_2HCl_3O_2$).

Trichloroacetic acid, discovered in 1838 by Dumas, is made by treating chloral hydrate with three times its volume of nitric acid, and placing the whole mixture in the sunlight until the red fumes disappear. The liquid is then distilled, and the portion coming over at 195° C. is pure trichloroacetic acid. The trichloroacetic acid is easily soluble in water or alcohol; it is a powerful caustic, quickly destroying the epidermis or mucous membrane. It is found to be in colorless, rhombic, deliquescent crystals, freely soluble in water or alcohol. It is a product of the oxidation of hydrate of chloral by means of nitric acid. It is an escharotic. When diluted with water to three per cent. it is an excellent local astringent and stimulant. When it is used to soften or decalcify the serual plates attached to the roots of teeth, a ten-per-cent. solution in water should be used. The action of the acid may be nullified with carbonate of soda, magnesia, or any suitable alkaline solution. The trichloroacetic acid seems to have that peculiar property of softening calcific and sanguinary deposits on the teeth without injury to the substance of the tooth.

Trichloroacetic acid is submitted as an agent of undoubted value in dental therapeutics for the following purposes:

1. Its solvent effect on calculi on the roots of teeth.
2. Its destructive effect on the pus-producing surface of the sockets of teeth.
3. It is a good astringent.
4. It is a stimulant.
5. It is an energetic caustic for the destruction of morbid growth, epulis, and excrescences on the pulps of teeth, overhanging gum on third molar teeth.
6. As a refrigerant mouth-wash in one-half- to one-per-cent. solution in water.

SYRUP OF IRON CHLORIDE.

In all cases where an efficient tonic preparation of iron is to be taken by a patient, the elegant formula of Dr. G. W. Weld is to be preferred to the pharmacopœical preparation so long in use, as it is not injurious to the teeth.

Many members of the medical profession are prescribing Dr. Weld's formula, and it becomes our duty to insist, when iron is to be used internally, on the patient taking the non-alcoholic syrup of iron chloride.

The dose is one tablespoonful, diluted with three times its vol-

ume in cold water. It acts as a diuretic in anæmia, erysipelas, diphtheria, and neuralgia, and in many cases it has no equal as a prompt remedial agent.

DISCUSSION.

Dr. Abbott.—I am both astonished and pleased. I am astonished that such men as Koch, for instance, should have made a mistake, —astonished that so many men, after his experiments with bichloride of mercury, should have kept on making mistakes. It seems that every year a prop is knocked out as far as antiseptics are concerned. We will soon find that we have nothing that will destroy germ-life, and that germs are as thick as ever, without our possibility of destroying them. If there is anything in the world that will destroy organic life it is bichloride of mercury. It will kill positively. If it will destroy human life and all kinds of animal life, we must naturally suppose that it will destroy the organisms which prey upon human or animal life.

From the paper read by Dr. Hunt, we are led to believe that nothing will destroy the organisms about the mouth. In our practice, however, we have seen wonderful results from bichloride of mercury. It does away with the possibility of suppuration, and a general disturbance brought about by the organisms, and we rely upon it, as all surgeons in the country do. If that be true, it seems that there must somewhere have been a mistake in the work of this last experiment. I do not believe any man is infallible, and sometimes the variation of a hair will give results that will carry him almost entirely away in direct opposition to others; so we have just as much right to continue the use of bichloride of mercury as we ever had, and we can get good results from it just as well, notwithstanding the experiments made.

In the treatment of pyorrhœa alveolaris and all alveolar diseases, there is nothing that will take the place of chloride of zinc. It is, in the first place, an escharotic, a stimulant, and a powerful astringent. We have all three qualifications, and besides this it is quite a strong antiseptic, so that it gives us for certain uses around the mouth qualities that we cannot get from any other substance that I know of. It will not stain anything that you use like sulphuric acid. Sulphuric acid, if it touches your clothes or your napkins, destroys them. If chloride of zinc comes in contact it does not harm.

The remedy that Dr. Harlan has referred particularly to, an agent for treating general diseases of the mouth, I know nothing

about, but from his statement I fancy it is a very excellent thing. If it will relieve those painful points under plates it is certainly a remedy that every one should have in his office. If it will relieve the pain around the roots of teeth where crowns have been set, or where tartar has been removed, it certainly is worth much in practice.

The preparation of iron prepared by Dr. Weld, of New York, is somewhat peculiar. It is claimed that it is not an acid, and will not affect the teeth; but there is another feature about it. Let it stand in your office for a week or ten days, and you will get a precipitate one-quarter the depth of the bottle. The iron seems to precipitate, and you get comparatively no iron except when you shake it, and then, of course, it is not in perfect solution. Whether that has been overcome I cannot say; but I think it has. Of course Dr. Weld's preparation is a most valuable one, if what has been said about it be true, because if anything has done injury to teeth it is this chloride of iron. Anæmia always follows that condition of malarial poisoning that we find in malarial districts, and the treatment that is generally prescribed is first quinine, and then the tincture of chloride of iron. It is an excellent preparation as far as the general condition of the system is concerned, and to retain the restorative properties of the preparation that are in the tincture, and still get rid of the bad effect which it has on the teeth, is a wonderful thing to have accomplished, as far as the welfare of the people is concerned.

Dr. Marshall.—I want to refer to one remark that Dr. Abbott made in regard to the use of antiseptics. He said that almost all surgeons rely upon bichloride of mercury in their operations. That was a very broad statement. There are many surgeons who do not use it at all, but rely simply upon sterilized water, especially those who make abdominal sections. There is one surgeon in Chicago who has not for the last three years used bichloride of mercury at all. He simply uses sterilized water. His instruments are all boiled before being used. His own hands have been thoroughly cleaned with soap and sterilized water. The parts are washed with soap and water before the operation is made, and then washed off again with the sterilized water; the sponges have all been boiled; the irrigator is charged with sterilized water, and the abdomen is washed out with it. Stitches are applied after the operation, and it is again washed with sterilized water. I have seen many of those cases, as I am connected with the same hospital, and he has had better results by the use of the sterilized water than

any of the other men have had with the bichloride of mercury solution.

In regard to the report on anæsthetics, I have never used pental, but just before leaving home I came across a report from Professor Goerek, the chairman of the Committee on Anæsthetics of the German Association, in which he gives a report of 109,230 cases of narcosis, in which 39 proved fatal. Of this number, chloroform was used 94,123 times, with 36 deaths, or one in 2614. That is a little larger than is generally estimated. The general estimates have been one in 23,000 to 25,000 in chloroform. Out of 8432 cases of narcosis with ether, there was one death. That is a better percentage than we used to know about. We used to say one in 5000. There were 2891 cases of anæsthesia with chloroform and ether combined, with one death. There were 1380 cases of ether and alcohol combined, with one death. There were 2179 cases in which bromo-ethyl was used, with no deaths, and 219 in which pental was used, with one death, proving from its report that pental is the most dangerous of all.

Dr. Peabody.—There is to my mind no subject in our profession which has as much interest in connection with it as that of this section. Our information in regard to therapeutic agents has been rather limited. We have too many agents altogether in our dental practice, and yet we have too few. New discoveries are being made yearly; old and tried ones are laid aside. The new ones will, in the hands of certain operators, produce results which cause the larger proportion of the profession to rush to it, expecting effects of a similar character. In probably fifty per cent. of the cases where these new remedial agents have been tried, they have been followed by failure. We, of course, want new agents that will produce better results than those we have at present, and we are constantly in search of them. Those gentlemen who are capable of making investigations of this character are the lights to whom we look for information, and we receive it from that source. But occasionally some one who is not gifted with an immense amount of chemical information by accident stumbles on something which produces equally as good results as those which are brought before our profession by men of a greater degree of intelligence. For my part, I hardly understand why old, tried, and true remedial agents are cast aside. We have had good effects from such agents as carbolic acid and creosote, the first things we used. Only a short time ago I was struck by two statements that I saw in dental journals. One person in writing on carbolic acid said, "Creosote

I have no use for." Another said, "Carbolic acid I have no use for." They probably received benefit from the use of other agents, and on that account they were inclined to look down on those with which others had been satisfied. Iodoform has been in the hands of the dental profession for some time. Different men have produced different results. Some depend upon it entirely in connection with the oils, while others have no use for it at all. They prefer something of a different character, partially on account of the disagreeable odor.

I have brought to the Association, for the purpose of allowing the gentlemen to see it, a very simple instrument, composed of a tube passing through a cylinder, the tube being closed from the centre, perforated on each side of the closure for the discharge of gases. This cylinder has been used only with iodoform. The idea is to unscrew this cap, put in some crystals of iodoform, hold it over the flame of the lamp, and placing it in the hands of the patient, request him to use it, and by holding this in the tooth, the vapor of the fused iodoform is passed under pressure into the tissue.

The results of the use of this agent have been wonderful. I cannot enter minutely into the properties of it, but I want to state more particularly the effects that follow its use. By the heating of this cylinder the iodoform is fused and iodine is eliminated. That passes into the tissues, disinfecting them. Iodoform is considered not to be a disinfectant; some say it is not an antiseptic; in the form of vapor it certainly controls septic troubles. The passage of the vapor of iodoform into the canal of the tooth, which is filled with pus, will disinfect the tooth and destroy the pus and inflammatory conditions. So capable is this vapor of iodoform under pressure (I am not speaking in favor of iodoform, because I think it can be superseded by something of a better character) that there is no portion which it cannot reach. For instance, placed in the canal of a tooth, the vapor will permeate every sinusity, disinfect the tooth thoroughly, and leave behind it a solid, insoluble precipitate of iodoform itself. I have a tooth here which was subjected to the vapor,—the root has been ground down. Even the tubuli are filled with this iodoform precipitate. It reaches the peridental membrane, and as it is a non-irritant and is in the condition of vaporization a disinfectant, irritation is reduced, the septic matter is destroyed, and the tooth, by means of that instrument alone, restored to a normal condition, as far as a tooth which is deprived of the living tissue in the pulp can be restored. Loose

teeth have been reduced to a condition of firmness. In the College of Dental Surgery this was in the hands of students who were not experts, and there have been six hundred teeth subjected to this process. Out of that number, as far as is known, there have been but two failures. This process has been in use for about three years, and the person who introduced it states that he has had but one or two cases returned. In one of these failures, in the infirmary, the student having charge of the case subjected an inferior bicuspid tooth to this treatment.

In using iodoform the odor is very objectionable. Under the vapor the odor is not as perceptible as in the ordinary condition. The greatest objection is the fact that it has such a bad effect on the instruments. Upon almost every occasion I have found the instrument covered with a film of iodide of iron. In a very short time it will rust any instrument brought in contact with it. It occurred to me that perhaps aristol might be a substitute for iodoform. Dr. Hunt stated that aristol was a non-irritant. It has been experimented with very slightly with this instrument; not sufficiently, however, to form any absolute conclusion in regard to it. Still, the slight experimentation which it has undergone has led the operator to believe that it was an irritant.

I consider the application of vapor under pressure an idea which is calculated to a great extent to revolutionize the practice of therapeutics in general surgery.

I will state that the ordinary crystals of iodoform will not produce such good results as the conglutinated forms. Whether they are adulterated or not I do not know, but they do not produce as heavy a vapor or as heavy a precipitate. I hope you will investigate this matter, and in the course of the next twelve months come prepared with something that is superior to anything we have.

Dr. Hunt, of Indiana.—I want to say a few words in regard to bichloride of mercury. Dr. Abbott very truly stated that it was sure death to animal life, but we know that the higher and more complex the organization the greater the influence of deleterious agents on it, and the lower the organization the more it will stand. For instance, a snake displays muscular activity after its head is chopped off, so does a turtle and a chicken; but as we ascend in the scale of living organisms towards man, the most perfect, we find that immediate death is induced by such catastrophes as cutting off the head. Then, again, while bichloride of mercury may be certain death to animal organisms, it has not been successfully proved that it is always certain destruction to vegetable parasites.

The portion of the report referring to bichloride of mercury was as new to me two weeks ago as it was to you gentlemen this morning, but I have been assured that the experiments were very carefully conducted under the supervision of very competent persons of considerable experience in that line, and I think it probable that there may be more in it than we at present believe. We know that in surgical operations, even with the best antiseptic precautions and the use of bichloride of mercury, we have occasional failures. Every once in a while there is septic poisoning, even with the use of the best antiseptics. When that occurs we are all prone to lay it to the fact that we have used something that has not been thoroughly disinfected; but that is only a supposition; and might we not as well suppose that when we have used bichloride of mercury the conditions have been such as the paper mentions; in other words, that the germs have been covered with an albuminous coating by the bichloride, and that it has been washed off in the blood and sepsis has resulted? It seems to me that that part of the subject requires further investigation before it can be disposed off.

The use of chloride of iron is very much to be commended, and in this connection I would like to state that the use of chloride of iron pills are preferable to any other form of iron when the patient's stomach will digest that. I have in mind a case of anæmia complicated with gastralgia. The patient had had it off and on for ten or twelve years, the attacks being not at all regular, but very severe. I gave her the chloride of iron preparation for about a month, and followed that up with strychnia, one-sixtieth, and then chloride of iron pills, keeping up the treatment for three months, and six months have passed with no return of the gastralgia. So if the patient will stand it, those pills are the best way to administer the chloride of iron.

In regard to Dr. Peabody's suggestion on iodoform vapor, I don't think there is anything particularly new about it. The method of using iodoform vapor in the root-canals was fully discussed by Dr. W. H. Whitslar, of Cleveland, five years ago, in the *Dental Review*, and it has been quite thoroughly proven that while the iodoform vapor is heavily charged with iodine, and is antiseptic, yet the iodine disappears very readily and very quickly, leaving behind only a carbonaceous residue. This is aseptic, and not antiseptic, and therapeutically inert; but it is far better than septic material in the root. The iodine is all evaporated, leaving this material behind, as can be demonstrated by the use of the microscope.

Dr. Abbott.—There is one point in reference to the use of antiseptics which it would be well for us to bear in mind. You will remember that many years ago we had the impression that carbolic acid was one of the best antiseptics ever known. I think the authority for this idea came from Germany. One person will state that carbolic acid is the best preparation as an antiseptic; another experiments with it, and he finds that he has seen germs of different kinds working their way around over crystals of carbolic acid, and that they were not at all disturbed by it, but lived near it as well as anywhere else. Investigation showed that carbolic acid, when properly diluted, would destroy germ-life.

In the experiments described in the paper very strong preparations were used. A saturated solution was one in which the germs lived a certain length of time; another was a twenty-per-cent., and another a fifty-per-cent. solution, and so on. Should these solutions be too strong, reduce with water, and the effect may be better. For instance, 1 in 20,000 of bichloride of mercury is a good solution. I use that for washing out canals of teeth and abscesses. I never use anything to throw into the mouth stronger than 1 in 10,000, and it was determined some time ago that a preparation of 1 in 100,000 was strong enough to destroy any kind of germ-life in existence, and this only occurred a short time ago. It seems very curious that so many men should be experimenting with this material and getting such different results. There is something wrong about it; they do not work alike, or they certainly tell what is not true as a result of their experiments.

Dr. Low, of Buffalo.—I remember a very interesting series of experiments of Dr. W. D. Miller with bichloride, carbolic acid, iodoform, and many other medicaments, and if his conclusions are correct, the bichloride of mercury seemed to be the only one which would destroy life. I believe the proportion was 1 to 480.

In regard to root treatment, if others had had the same experience with iodoform that I have had they will not use it, on account of its odor and the taste it leaves in the mouth. From some experiments that I have made, I do not believe that it is possible under any circumstances, with any vapor of any substance, to perfectly produce antiseptic conditions in the root; and if we remove what we can with bichloride of mercury, or peroxide of hydrogen, which, by the way, has not been mentioned, and completely dry out those pulp-canals and fill them with an inert substance like chloro-percha or gutta-percha, we can depend upon nature to eliminate the germs there. One case, I remember, was in the mouth of a female patient

about thirty years old; it was treated very carelessly with peroxide of hydrogen. In twenty minutes the tooth was filled; the gum was painted with bichloride of mercury, the extracting-forceps used, and the tooth placed in solution. The best microscopist in Buffalo carried on the experiment, and nothing was developed. The same experiment was tried with a patient equally healthy, and the tooth extracted immediately after, and the bacilli were found immediately. So we must rely on nature after all.

Dr. Fillebrown.—It is not bacteria that make trouble in the human system. Put bacteria of any kind into the living, healthy tissue, and they will perish as quickly as they will in any of the antiseptics or germicides that you have mentioned here. It is only the dead tissue that forms food for them. When we get blood-poisoning into the system, it is from their products. I am not giving anything new; I am simply calling your attention to facts. If you will perform a surgical operation of any kind, and will be sure to leave no *débris* there, if you will bring the surface close together, I will take all chances for the flourishing of bacteria. I think the use of antiseptics or germicides is very much over-estimated. As Dr. Abbott said, when the use of bichloride of mercury gives such widely-different results in the hands of different men there is something that is not comprehended and not used rightly; there is some fact not yet discovered, and within the last fifteen years the disuse of germicides has been growing, and many of the most eminent surgeons are to-day doing their operations without the antiseptic precautions that Lister first advocated.

It has been proved by a long series of experiments that a solution strong enough to destroy the germs will be strong enough to exceedingly injure the delicate tissues on which we operate. Just bear in mind that thoroughness, carefulness, and cleanliness are of more importance than the antiseptic solution that is used, and that the operation which is clean fulfils the essential principles that are required in all these cases that we have.

Dr. Peirce.—I have kept my seat, hoping somebody would say what I had to say. The paper read by Dr. Harlan made reference to the trichloroacetic acid. About a year since Dr. Kirk asked me if I had tried it in my practice. It has had such eminently successful results that I must say a word about it. Where you have a spongy condition of the gums which you desire to remove, or a growth over a third molar, or any condition of that kind, it is the most appropriate application that can be made, by simply taking a little wooden spatula, saturating it, and rubbing it over the tissue.

It is a powerful escharotic, and in one or two applications you will remove the abnormal growth. Again, where you have the little nodules of calcific deposit on the roots of the teeth, with the same little wooden spatula you pass down into the apex and cleanse off the surface of these roots. I have no hesitation, wherever we have the calcific deposits, in using this acid, even in its full strength, in that way. It cleans off the root thoroughly. After you have used your scalers, use this, and it will remove every vestige of the calcic deposit. Then, again, it has a very happy result on the tissues themselves. Being a powerful escharotic and astringent, you will find that an application into the pocket will arrest the accumulation of pus that is so common, with one or two applications. I have had very desirable results from its careful use in all the cases of pyorrhœa of this nature that I have treated. I have no hesitation, if I open into the root of a tooth, to dress the pulp by taking a little circular spatula and forcing it up into the root; the acid will destroy the tissue, and you purify that root, in a moment's time, more perfectly than you can with carbolic acid.

Dr. Patterson.—The report of the Section is interesting, especially that in reference to nitrate of silver. We all have a great number of young patients, between two and three years of age, whose deciduous teeth are threatened with incipient decay. It is almost impossible to introduce any filling-material in their teeth. It has been suggested that incipient decay can be arrested by the application of nitrate of silver. In that I have been experimenting, and I do not know what the result will be, because the experiments are very recent. If we can arrive at a solution of that difficulty in this case it would be a great thing. I have been told, since this paper has been read, that this is not a new treatment; this practice had been used in former years. If any one has experience in that line I should be pleased to know what the result has been. So far as I have been able to watch it in the three cases in which I have tried it, it is entirely satisfactory. I do not care if it discolors and makes the cavities as black as can be, so long as it preserves the deciduous teeth.

Dr. Taft.—In regard to the use of nitrate of silver, I remember that more than forty years ago Professor James Taylor, in his instruction in the Ohio College of Dental Surgery, recommended that treatment for decay of the teeth. Recognizing then the fact that the darker varieties of decay were the slower, the suggestion was made that by the use of the nitrate of silver the decay was changed from the light and rapid to the dark and slow. It was used in the

deciduous and permanent teeth, and from that time to the present day I have been in the habit of using this material in certain cases, especially in the deciduous teeth, and I have been warranted in continuing the use of it from the good results received. A year ago, at Saratoga, this subject was presented by Dr. Stebbins, of Massachusetts. He presented a boy whose teeth had been treated, and the decay seemed to be arrested.

I have experimented as much in permanent teeth as in temporary ones, but it has always been attended with good results. As to how the result is produced, my impression is that it is by its antiseptic powers, and by its destruction of the germs that are operating in the process of decay. That it does produce good results, and that it was used as long ago as forty years, I know positively.

Dr. Truman.—Ever since I have been in the profession I have attended dental meetings, and whenever any new subject has been presented there has always been some one to claim originality. Dr. Taft says he has used nitrate of silver for forty years. Why has he not given it to the profession? I have no confidence in that form of dentistry. I have been in the profession over forty years, and I think I am tolerably familiar with its literature throughout that period, and I have yet to see a single paper on nitrate of silver that did not take the position that if you use it in teeth it will so discolor them as to be injurious. If Dr. Taylor or Dr. Taft had been in the habit of using this agent for the purpose recommended by Dr. Stebbins at Saratoga last year, they are to be censured for not publishing it. Dr. Stebbins I hold to be the originator of this process, and it is one of the most important things introduced in dentistry of recent years. I am not willing to sit here quietly and have the credit placed where it does not belong.

On the general topics that have been before us I know almost nothing. I have experimented with germicides perhaps as much as the majority, but I do not believe there is a single germicide extant to-day that you can absolutely depend upon. Therefore we must wait for future investigation before anything positive can be determined. Clinical observations do not always support those of the laboratory, and the results in the latter are not always sustained in practice.

Dr. Taft.—Either what I stated is true or it is not true. Dr. Truman says it is not true.

Dr. Truman.—I deny that I made any such statement; I said simply that it was not given to the profession; and if true, no credit of discovery was deserved.

Dr. Taft.—I did not claim originality ; I simply stated where I saw it first used, and that I used it since that time myself, and I have not kept it a sealed matter all these years. I have occasionally spoken of it. I do not remember whether I mentioned it in this Association, but I have referred to the source of my information in regard to it, and the results of my own experience. I think the statement Dr. Truman made needs a little modification. I know also that things oftentimes are presented anew ; things that have been long ago forgotten are revived or revised and brought forth as a new thing. I know that is true in regard to nitrate of silver.

Dr. McManus.—Nitrate of silver has been used for many years. I know my preceptor frequently employed it about the necks of teeth, where they are often sensitive. I know about five years ago a lady came into my office whose teeth were in that condition, and a dentist had been treating her with nitrate of silver. Her teeth had been so sensitive that she could hardly brush them, and after the use of this agent they were very comfortable, the only objection being the discoloration. I know Dr. Stebbins well. He is an old friend of mine. I saw those cases before they were presented at the Saratoga meeting, and I have seen them since, and I know that they have been very successful. They have arrested the decay, and the use of nitrate of silver has made the teeth very comfortable. There are many remedies used by men who have never attended society meetings. The unfortunate thing is that there are many who do not attend these associations. They do not come for many reasons ; one of them is, that they are barred out of local societies, do not get into membership, and of course are not appointed as delegates. My old preceptor never attended a society meeting in his life, and as far as general intelligence is concerned he was the equal of many now present.

Dr. Haroun.—I have known Dr. Taft intimately since 1858 ; I knew Dr. James Taylor a short time afterwards, and both of these gentlemen have reported the use of nitrate of silver, I myself having used it through information received from them. It may not have been reported in the journals, but I have heard them speak of it. We knew it would blacken teeth, but used it regardless of discoloration.

Dr. Barrett.—I have heard Dr. Taft refer to this repeatedly, and I can place my memory upon the exact time and place for one of those periods : that was at the meeting of the Michigan State Dental Society. I know he has reported it and spoken of it frequently. I

apprehend that he thought it was so well known and was such an old remedy that all that was necessary was to call the attention of those present to it. It is really an accepted remedy in practice, having, however, certain disqualifying properties, and there are certain things in it that are objectionable.

Dr. Truman.—I did not implicate Dr. Taft. I simply said, Why did he not publish it to the profession? He has stated it occasionally at conventions, but a series of experiments, such as Dr. Stebbins made, running over six years on one agent, I have yet to see from Dr. Taft's pen or from that of any other person. I am perfectly familiar with the use of nitrate of silver in dentistry for the past fifty years. My memory is not treacherous.

Dr. Moore.—I want to call Dr. Truman's attention to the fact that in an institution in which he was professor for a long time, —twenty or more years ago,—we were told to use that remedy not for the purpose of treating pyorrhœa alveolaris, but for sensitive dentine. Professor Truman, Dr. Peirce, and other gentlemen doubtless remember this.

Dr. Peirce.—I do not remember the time when I did not keep my stock of nitrate of silver in the office for the purpose of obtunding sensitive dentine, but that is very different from the systematic experiments made by Dr. Stebbins. I have taught that it was one of the best materials we have for relieving the sensitiveness of a tooth where it is to be cut down. I have taught that to every class. It was spoken of twenty years ago, but not for the purpose of arresting decay, and I must coincide with Dr. Truman when he says that Dr. Stebbins was the first one who published a systematic method of using it.

Dr. Peabody.—Over twenty years ago I used nitrate of silver on many occasions for the purpose of relieving the sensitiveness of teeth at the necks, and I have known of it since that time; but it is only within the last twelve months that I ever heard of it for arresting decay. Dr. Taft said he had heard of it for the purpose of changing light decay to dark decay, because dark decay progresses more slowly. I never heard of it in that way, and its use by the profession, as far as I know, has been for the purpose of relieving the sensitiveness, until Dr. Stebbins introduced the idea of arresting decay.

Dr. Crawford.—I do not expect to be able to throw any additional light on this question. There is no doubt to my mind but that nitrate of silver has been recognized as an agent in the treatment of diseases of the oral cavity ever since the or-

ganization of the dental profession. These gentlemen are both right; both sides are right, and yet both are wrong. The only point at issue is as to who is entitled to the credit for the application of nitrate of silver for the treatment of children's teeth. Dr. Stebbins is entitled to that honor; but that Drs. Taylor, Taft, Murray, and Harris, and all men who have written works on the subject of dentistry, referred to nitrate of silver, is certain. However, none have made the high claim that it was capable of arresting carious action. Most dentists dwell upon the idea of using it as a comfort-giving application, just as they use it as an application for a sore or ulcer in the mouth. That is a synopsis of the history of nitrate of silver, as far as I know.

Dr. Harlan.—The points brought out in the discussion are rather satisfactory to the committee making the report, but to clear up the cloudiness surrounding the subject of the use of bichloride of mercury solutions, I would state that the experiments of Laplace, of Philadelphia, showing five parts of tartaric or hydrochloric or carbolic acid added to the 1 to 1000 solution of bichloride would make it absolutely reliable as a destroyer of micro-organisms. There have been no experiments anywhere to disprove that. That conclusion has been arrived at clinically by Dr. Black, of Jacksonville, who dissolved his bichloride of mercury in peroxide of hydrogen. Dr. Black has never had reason to abandon the use of it on account of its failure to destroy micro-organisms in the human mouth. The general subjects treated of by the secretary of this Section have been very well discussed, and he has made a very excellent *résumé* of what he had to say. The point that I desired most discussed, with reference to the properties or use of eucrophen and trichloroacetic acid, has been lost sight of, except by Professor Peirce. For the benefit of those gentlemen who did not hear the paper, and who are going to make renewed efforts, I will say that eucrophen is an agent that is destined to take the place of iodoform; it is almost non-odorous, non-poisonous, five times lighter, and will answer admirably for all the purposes for which iodoform has been used. The trichloroacetic acid, as has been stated, is very useful for the solution of those particles of sanguinary deposits on the roots of teeth that are almost inaccessible. It is useful as a stimulant and astringent, and to check the formation of pus on the mucous membrane of the mouth, and it is a very excellent refrigerant mouth-wash in all inflamed conditions of the mucous membrane. As a mouth-wash, use one-half to one per cent. in water. It is freely soluble in water, and for the removal of deposits on the roots of teeth a

ten-per-cent. solution in water may be used, and it may be followed by magnesia, sodium, silicate, or any solution that you may have handy.

Subject passed.

SECTION IV.

Dr. Abbott, chairman.

Dr. Abbott.—I have been trying for months past to have an instrument made to show you for the purpose of illustrating certain work. It is simply a camera for making micro-photographs which we could not procure. I expect with it to produce very excellent results, and which will aid in clearing up some points still in doubt.

I have only one paper, and it is a voluntary article, and with your permission the writer will read it. It is one of the most interesting cases I have ever seen, and I think it will strike most of you as being very peculiar.

Dr. Stainton, of Buffalo, then read the paper described.

CROWNLESS TEETH.

BY C. W. STAINTON, D.D.S.

It has been my fortune to have in my practice a family presenting some traces of heredity rather unusual in their character.

I exhibit to you casts of the mouths of three members of this family, being one-half of the children in it. The peculiar hereditary strain is the absence of crowns to the teeth.

The history of the condition is, as usual, quite meagre. The father is an intelligent man of business, one of the prominent men in a large city, of good physical organization, having six children by two marriages. By the first marriage he had three sons. The eldest has splendid teeth; the second and third sons are specimens of this peculiar condition, and I exhibit the casts of their mouths marked 1 and 2.

By the second mother there were two daughters and one son. The eldest by this second marriage, a young lady of eighteen, is the case presented in cast No. 3.

The history is unsatisfactory from a professional stand-point, but, as Dr. Talbot says, "as good as one ever gets" is about like this. The maternal grandmother had such teeth; she inherited it. Back of that the line is broken. Whether any of her brothers or sisters had such teeth is unknown.

The only certain point known by the father is that he inherited

this from his mother's side, and that she also inherited it. His mother had eight children ; his teeth were the most defective. Two others had very poor teeth ; but whether they were wholly crownless, like his, is uncertain. His idea is that four of the eight had very good teeth, one middling, and three poor. That is all the history I can give you.

When I first became acquainted with the father, about twenty years since, he was wearing an upper denture, which articulated against a few scattered roots in his lower jaw. I have made him in that time two full dentures, opening his mouth probably three-eighths of an inch, improving greatly the contour of his face by removing the too near proximity of the nose and chin. This peculiarity, the shortening of the facial contour, the causation of which will be apparent to all, is the chief distinctive feature or deformity in all these cases. It is especially apparent in the third case, where the well-developed miss of eighteen years, in consequence of the shortening of the face, has a retreating chin. (See model No. 3.)

The first case, that of the second son, came under my observation in 1879. He had occasion to visit me several times on account of the roots becoming sore and troublesome. I removed two at different periods for this reason. In the summer of 1881, he having reached eighteen years of age, and his mouth apparently being well developed, I extracted the roots in the upper maxilla, and in September following made him a set of teeth. He had been waiting with great impatience for this time to come. It was almost impossible for him to articulate satisfactorily, and his course in elocution at the normal school had been largely a failure, because the tongue had no front teeth to strike against to produce certain sounds.

His personal appearance was greatly benefited ; the shortened face became at once nearly normal, and the improvement in speaking and singing was very marked.

I do not think there has been any arrest of development of the arch in this case, although that is an assumption and not a matter of positive knowledge. He is not wearing the original plate ; a fit of nausea in April, 1889, ended in its destruction.

He claims, however, that it fitted all right. You will see when you look at the model of this mouth, No. 1, a most remarkable antagonism. Two surfaces could hardly be in more perfect apposition. He could almost bite a thread anywhere about the ridge.

The roots extracted in this case were very imperfectly developed

and were loosely attached to their sockets, so much so that I removed them all at one sitting without an anæsthetic and without any complaint on the part of the patient, many being similar to loose deciduous teeth.

The third son, seeing the improvement in his brother's condition, was desirous of some such treatment, but I kept him waiting until he was eighteen years of age. In October, 1885, I made him an upper plate. The model shown of this case, No. 2, is not so perfect a representation of the conditions as it ought to have been. I forgot to take an impression of his teeth until after I had extracted several of the roots.

With a remembrance of the ease with which I had extracted the roots in the first case, I tried to extract these, with the assurance that it would not be very tedious to the patient; but I found they were better developed and very adherent, so that it was extremely difficult to extract them at all; and after removing the roots of the incisors and the bicuspid of one side, I ground off those remaining and made a plate over them.

The model in this case shows the condition after the mouth was prepared for a plate, and not, as it should, before anything was done. A peculiar condition in this case was that the front roots could not be made to touch each other. Of course my model makes this condition more pronounced, because the roots of the incisors are absent and some absorption had taken place in the few months between extraction and the taking of the impression, and I have also smoothed off the roots of the cuspids; but he never was able to get the incisors within a line or two of each other, and yet you can see how smooth the lower roots have become, though these have not been touched by the wheel.

The making of a denture for this case was not nearly so easy as for his brother; to open the bite sufficiently for anything between the molars made the incisors too prominent for a mouth never showing any, and with a lip that lifted as far as the nose would allow at the slightest provocation.

My first attempt was not satisfactory, but a second was fairly successful. This patient is one of those who will crack nuts and bite hard candy with his teeth, so that I have had to replace this plate, made in 1885, simply because he had fractured these thin, pinless molars.

Model No. 1 shows apparently purely mechanical abrasion. Model No. 2 shows the same condition posteriorly; but the anterior roots show chemical rather than mechanical abrasion. This subject

tells me he never has been able to bite anything with his front teeth, as they never came together.

Model No. 3, that of the miss of eighteen years, exhibits what neither of the others shows, a fairly good crown to each central incisor. This model is articulated with her mouth at rest; but she has a rather unusual ability to project the lower jaw. This case seems to demonstrate that there was an effort to produce crowns, but so poorly were they organized that they have been easily obliterated. What is left of the centrals is because she cannot protect the lower jaw sufficiently to wear these away.

This model shows plainly another thing, the presence of decay among these teeth. The first permanent molars above, and the first and second permanent molars on one side below, have extensive caries; there is almost no trace of decay in the other cases.

There has been no attempt to do anything in this case. The two central incisors give some appearance of teeth, although they are quite discolored. The young lady assures me that she intends to let them go as they are as long as she lives.

In all these mouths the color of these roots runs from a dark amber to that of an old clay-pipe black with nicotine. I have known all these cases since they began to erupt their permanent teeth. Their teeth have always presented this same crownless appearance; but I am persuaded that the effort was made to give them normal crowns, but they were so soft that they were soon worn smooth.

The lower wisdom-teeth in Numbers 1 and 2, as also several of the teeth in No. 3, are indicative of this. Case No. 1 has apparently transmitted this trait to his children. A little son about four years old has crowns to the deciduous teeth so poor that they dissolved almost as soon as they appeared through the gums.

Of course, we can only conjecture what the permanent teeth will be, but the father has no faith that they will be any better than his own, and I think he has reason to fear this result.

DISCUSSION.

Dr. Abbott.—The history of these cases carries us back to embryology, to the formation of these teeth. The question as to how it occurred and what produced it is something that we will be unable to determine, but that the enamel organ has been placed in a condition unfit to perform the proper deposition of lime-salts is clear. We find isolated cases of this kind, where every tooth in the

mouth is in the same condition as these. It is a case of improper calcification of the enamel of the teeth, the enamel organ not performing its function. What arrested the function of the organ is unknown. In almost every case it is due to some local disease in the mouth, not to any disturbance, unless it be a very long-continued one. In all the cases noticed of the partial or the general imperfection of the enamel, it is found to be due to a local disturbance of the mucous membrane. I want that point noted, because I desire you should observe it. In studying the subject microscopically, I have come to the conclusion that no faulty development of enamel takes place, as a rule, where the local disturbance is not present. A little boy came to me some years ago whose front teeth had no enamel at all, and were so stunted that the dentine was but one-half of its normal thickness. I asked the mother if the child had had any disease, and she said no; the child had been well from the time of its birth up to the time I saw it. The father was a physician, and I told him the child had a very peculiar condition of the teeth, and the mother had stated the child had never been ill. I said some disturbance must have occurred to affect those teeth. He confirmed the statement of the mother, and said the child had always been well. A few days afterwards I saw the mother again, and she said she remembered that the child had some sort of an eruption upon its body, which extended over its head and into its mouth, and the mouth became excessively sore. It did not make the child ill, and, therefore, it was not specially noticed. Here was a local trouble which caused the non-performance of the function of the enamel organ. It stopped its work, and no enamel was produced upon those teeth. Not long ago I had a patient with a set of teeth of a dark-yellow color and very highly pigmented, which indicated that they were improperly calcified. The lime-salts were not packed together in a solid manner, and the organic substance was in excess of its normal quantity, and the result was a discoloration of the teeth. These are discolored in the same way, due to a lack of lime-salts. To get at the cause would be almost impossible. It may have been thrush or some disturbance of the mucous membrane. There are local disturbances which occur on the face, and which often occur in a child's mouth, affecting its gums and the enamel. When a lesion occurs on the mucous membrane it will affect the organ itself. It must be a continued and severe illness, one which stops the growth of the nails and the hair, in order to affect the growth of the enamel of the teeth. It is a most interesting case. I know very well that this same con-

dition occurs in cases where there is apparently good development of the teeth originally. I remember, as a boy, seeing a gentleman who had all his teeth, as far back as you could see, worn down even with the gum, upper and lower, and they just came together as in the cases related by Dr. Stainton.

Dr. Peirce.—I should dissent from Dr. Abbott in stating that it was a local result. As far as the history of this case gives us any information, it seems to be a reversion from the grandmother on the father's side. The father's teeth, it seems, were not like them.

Dr. Barrett.—The father had exactly the same thing.

Dr. Peirce.—It seems to have descended from the grandmother. We have all met with cases similar in character. I remember that of one of my own relatives, where the mother and father were both consumptive. All through the period of gestation the mother was on the verge of the grave. The child was born, and the deciduous teeth were deficient in crowns. The permanent teeth came through,—that is, the first molar, incisors, and bicuspid,—and then were entirely deficient in crowns. The child died with scarlet fever at the age of twelve, but there was never any enamel developed on the deciduous or permanent teeth. It certainly was the result of improper nutrition on the part of the mother during the period of gestation and lactation, and of the inability of the boy to develop any strength during his life.

Dr. Morgan.—The case presented is evidently inherited. I rise to say that conditions very similar to this occur from local causes, and not from general disturbances. The teeth belong to the dermoid system. I hold that if the child suffers with scarlatina, chicken-pox, measles, or small-pox at the time the enamel of the teeth is being formed, that the enamel organ is of necessity involved, because it belongs to the general system, and it fails to perform its functions properly. In some cases you find the teeth eroded and little pits on the surface of the teeth, showing that the injury was done to the teeth at the same time, but in different localities, because of the stages of development which existed at the period of the disease, so that you will find the pits on the canine teeth close to the point, on the lateral incisors a little farther up, and on the central incisors much higher up, and so on. If you are careful in making your calculation you can come within a few months of the time when the patient suffered with some of these diseases of the dermoid tissues. We have that disturbance from local causes, and may have this pigmentation as the result of imperfect formation in the membrane which secretes the enamel. I have had the care of

children, and I have looked forward with fear, with the expectation of finding the permanent teeth in that immediate vicinity affected by the local trouble. I have had my fears verified by finding that after the teeth were erupted there were spots upon them that soon became discolored and afterwards disintegrated, because of the lack of strength and union which held together the particles. I hold to this as a general principle: that you may have it as the result of general disturbance and also from local troubles.

Dr. Hunt.—I simply desire to ask a question about the mouth itself. Everything here, apparently, is fully developed except the enamel organ, and that does not seem to have been entirely inefficient. The writer of the paper gave a history, but did not describe the character of the teeth themselves. I notice that these teeth look as though they were in the process of development and eruption, not disturbed in any way. It all seems to be normal. Here is a portion extending below the gingival margin, and I want to ask whether there was any enamel there.

Dr. Stainton.—It presents the appearance of secondary dentine.

Dr. Hunt.—Model No. 1 looks as if at some time the cutting-edges, or grinding-edges, of these teeth had been longer. Dr. Abbott's statement was that the enamel organ had not been able to perform its function. It appears to me as if there had been the full function up to a certain point, and then outside influences played a part in removing these lime-salts before the teeth were erupted.

Dr. Abbott.—As far as these particular cases are concerned, and that of many others, I have no doubt that there may be something in the way of heredity. As Dr. Morgan stated, there are many things inherited from several generations. The sins of the father are visited on the child, and sometimes it occurs that the sins are visited generations afterwards. It crops out in a portion of the family where we least expect it. I want it distinctly understood that I do not claim that every child that has scarlet fever, whooping-cough, measles, or even small-pox, has defective teeth. If this were the case, we would be a mass of people with defective enamel. The reason is that the disease does not take hold of the mucous membrane locally, or in contact with the point over which the teeth are forming. The enamel organ is not diseased nor affected by these disturbances. It is well known that in scarlet fever there is more or less sore throat. In some cases that becomes intense. The whole mucous membrane is involved, and there is difficulty in saving the child. In those cases the enamel becomes affected. Where

measles is expected, the physician first examines the throat to see if there is any disturbance there. If there is, he says the child will have measles. If that disturbance is sufficient to affect the mucous membrane, there will be defective enamel. I do not believe there is a case of one in a thousand where the mucous membrane has not been involved. From a general disturbance, as I have said, that affects every growth of the system, such as the nails and the hair, you may expect defective enamel.

Dr. Carroll.—Dr. Abbott endeavored to prove a line of heredity, stating that the sins of the father should be visited on the child, etc. It reminds me of another part of the Scripture in which a man was blind to a great extent, and they asked the question, "Who hath sinned, this man or his father?" You remember the reply, "Neither has this man sinned nor his father." The opinion prevailed then, and does to-day, and is promulgated by Dr. Abbott, that we can inherit disease. As representing a specialty of the great healing profession, I desire that Dr. Abbott and the rest of us be accurate in our statements. I think it is generally conceded on the part of astute pathologists, as well as physiologists, that we cannot inherit disease, that we can inherit only a tendency to it. That was nicely put by Dr. Morgan when he attempted to account for local disturbance. Your mother and father may have died with consumption, but you may not inherit it. You cannot inherit syphilis. You can impart it, but you cannot inherit it. Hence, in treating this subject, we should speak merely of an inherited tendency, which, under favorable conditions, would culminate in a disease. Just as in this case, because the grandfather had this form of teeth, and it was found in the grandson, it should not be called a disease. It is merely a lack of performance of function. The enamel organ that would have brought forth perfect enamel was weak, and, under favorable circumstances, would fail to produce perfect enamel. The mother before childbirth may have been in a weakened condition, affecting the enamel. The child, after birth, may have had the diseases of childhood. This inheritance of disease is a false idea, and we want to be relieved from it. Place the child under favorable circumstances, and, although both parents died of a disease, it will develop strength. Place it under unfavorable circumstances and it will become diseased, and then it would be asserted it inherited it.

Dr. Barrett.—If it be a fact that disease cannot be inherited, that we inherit only tendency, then it would be true that in syphilis we only possess the tendency to acquire it. The pitted enamel,

furrowed enamel, imperfect enamel, I cannot concede to be wholly due to local or general disturbance. If it be true that it is due to general systemic conditions, whenever there is such a pathological state as shall have produced it in one case, things being equal, it will always produce it.

Many of us know of cases of scarlet fever which have not resulted in defective enamel. There are many cases in which there have been very severe diseases, and yet the teeth themselves have been perfect. On the other hand, there have been cases that, so far as we may trace the history of them, have never shown any eruptive diseases whatever, yet the enamel was imperfect. How can we account for these things. If a law be a law, it must be unvarying under all circumstances. If it be due to disease in one case, it is always due to it under the same circumstances, and will always produce the same result. Ask almost any mother whether there was not, about a certain time, some form of eruptive disease of her child, and you get an affirmative answer. Nearly all children have them, but they are usually of so light a character as not to produce any serious disturbance. The effect produced, according to what we have heard, would be imperfect enamel from the whole cap of the tooth extending down as far as the development had taken place. I cannot concede that that is a fact. We have not reached the limit of our knowledge in this direction. There is something more which we do not comprehend, but I do not think it can be produced by any temporary change in the condition of the patient. In some cases you find the whole of the enamel down to a certain point entirely defective, but in others there is simply a line across the teeth, a defective spot which may exist on one side of a tooth. If it extended clear about the tooth, that would be additional testimony, but generally there is only a pit. This arises more from defective enamel, and not from constitutional disturbance, and not from local irritation. I believe it is due to a defect in the enamel organ by which it does not perform its functions perfectly, and so it may be that we have a defective point in the enamel, or the whole enamel organ may be defective. There may be a loss of the function, and you have no enamel at all.

Dr. Morrison.—The effort seems to be to locate the responsibility of this thing. What is needed is to find out how to overcome the difficulty. In nearly all of these cases the roots are well developed and well secured in the jaw, and, when that is the case, I regard it as a great mistake to destroy such foundations and put in any

manner of artificial appliance, I don't care how well it may be constructed. The proper remedy would be to furnish what Nature has failed to do, and that is, put a good metallic enamel on those teeth. I would suggest lengthening the bite a quarter or an eighth of an inch, and putting metallic shells on those teeth. The position of the young lady mentioned in the essay was decidedly a very wise one in not wishing the operation performed.

Dr. Patrick.—I think it is a well-established fact that a tooth is derived from the same source as that of the whole organism, and that is the mucous membrane. The dental follicle is brought into existence in the same way, and all its processes developed there. There is nothing better established in histology than that an organism, in the course of its development, may be turned aside, either in whole or in part. The result is there are no two alike. If I had a million before me there would be no two human organisms exactly alike. That growth is affected directly and correlatively there is no question. The enamel of a tooth could not, from the very nature of the case, be affected in its early stage, when it is in a plastic condition. When the enamel is formed it may decay. It may be injured mechanically, but it has no power of reparation. I know of one case in which the deciduous teeth, where they appeared through the gum, were denuded of enamel, granulated, and pitted, etc. That could only have taken place during gestation. The succeeding teeth of that child were perfect. In two other children of the same family the second teeth were defective and the first teeth were not. I have the casts of them, and I know that during the formative period of the enamel, or about that time, they were afflicted with eruptive diseases, and I know that the mother was afflicted with an eruptive disease,—scarlet fever. One of the children had what is commonly called chicken-pox. The other had scarlet fever, and the second permanent teeth were affected.

Dr. Head.—Was there anything extraordinary about the mucous membrane of the entire family, either of the father, the mother, or the children? Because, since the enamel organ is formed from the mucous membrane, it might be possible to trace the defect in the enamel organ from some extraordinary appearance in the mucous membrane. During this discussion concerning the cause of deficient enamel in children I was reminded of a case that was directly in our family. My nephew, at the age of three years, was taken with capillary bronchitis and was very ill. The whole system was so overcome that he hung between life and death for a

week and a half; and when the central and lateral incisors came through there was a distinct band all around them, where the enamel was entirely absent. In fact, all the teeth which were in process of formation at that time were so badly affected that the boy was really disfigured, and decay took place immediately. But now that the centrals and laterals have disappeared, the permanent incisors that have taken the place of the first teeth have come in with perfectly natural and healthy enamel.

Dr. Guilford.—In looking at the models, it occurs to me that this is simply an exaggerated case of a comparatively common condition, and, if I understood the essayist correctly, he was under the impression that no crowns had ever appeared or existed on the roots of these teeth. I think the crowns must have been there originally, although poorly formed, and eventually disappeared by wear. There was probably no enamel on them. The evidences of attrition are plainly visible. In model No. 1 the lower third molar seemed to have the cuspids fairly well developed. The third molar above has not been erupted, and there has been no strain to bear upon them. All the rest are worn smooth. The individual was compelled to eat upon them, and, biting upon the soft dentine, they wore away rapidly. Nature can vary her actions under certain conditions, and, although we do not always understand these, they are nevertheless interesting objects to study. There was a case similar to this presented by Dr. Barrett before the State Society at Williamsport, Pennsylvania. I think it was very much like this.

Dr. Barrett.—It was the same case, or at least one of the cases, presented here to-day.

Dr. Guilford.—The similarity was so great that I wondered whether two cases of that kind could occur in the same neighborhood.

Dr. Stainton.—With regard to the mucous membrane, in only one case was there any difference from a healthy membrane. The mucous membrane looked like the white of a boiled egg. The others were perfectly normal. If any one has looked at case No. 3, and noticed the wisdom teeth, it will be seen that there were no cuspids. I have known the young man for about twenty years. He is now about thirty years of age. He has always presented this same appearance of short, ground-off teeth; he never had any toothache, and never suffered with them at all. The objection made by Dr. Morrison, I expected. I had twelve teeth, and I supposed they were inclosed in model No. 1. If the doctor saw those

he would say at once that the question of crowning, or a bridge, was entirely out of the question. All the surface they had was the articulating surface, no nerve-canals whatever. Some of you may be able to make a bridge and crown, but when you look at this case you will find that you cannot do it very well. There was not a normally-shaped root in any of them. They looked like fused glass.

The young man came to me when he was about eighteen years of age, and he was very sensitive about his personal appearance. He could not speak well, and I was anxious to help him. He has worn the plate with great ease and satisfaction. The second case was much more difficult, and has not been so successful.

Dr. Morrison.—I referred principally to model No. 3.

Dr. Stainton.—The young lady does not care much about it. She was pleased with the improvement, although the teeth were as black as could be.

Subject passed.

Dr. Jackson reported, on behalf of the Committee on Credentials, giving the names of the colleges and societies sending delegates, and also the names of the delegates.

Dr. Jackson also reported, on behalf of the Auditing Committee, that the different accounts have been examined and found correct.

Dr. Barrett reported on behalf of the Committee on Amendments, and handed in the report to be printed with the regular transactions.

Dr. Harlan.—I have a resolution to offer which has been handed to me. It is as follows:

Resolved, That at all future meetings of this Association no dental exhibits of any kind be allowed near the place of meeting."

Carried.

Adjourned.

(To be continued.)

AMERICAN ACADEMY OF DENTAL SCIENCE.

THE regular monthly meeting of the American Academy of Dental Science was held in the Boston Medical Library Association rooms on December 7, 1892, at 7.30 P.M., President Brackett in the chair.

The paper of the evening was read by Dr. James A. Reilly; subject, "Unnecessary Pain in Dental Operations."

(For Dr. Reilly's paper, see page 164.)

DISCUSSION.

Dr. Brackett.—I heard a remark some years ago concerning a dental practitioner, that all his patients became his friends. If the remark were true, as I suppose it was, the dentist did not attain that end by disregard of such advice as Dr. Reilly has put before us. If there is no discussion of this paper, the next thing in order is the exhibition of models of a case of regulating with the appliances that were used by Dr. Smith.

Dr. Smith.—This case was treated in the Infirmary of the Harvard Dental School. The lateral incisors were crowded far inside the arch by the cuspids, and there might be a difference of opinion as to what teeth should be extracted. In this case I advised the student having charge of the operation to extract the first upper bicuspid. After that was done, an appliance was made to move the canines back into the places occupied by the first bicuspid. This appliance consisted of two Magill bands soldered together, and cemented to the bicuspid and molar on either side. On the buccal side of these bands was attached a screw, while the palatal surface held a small hook. To this hook a strong ligature was fastened and passed around a Magill band, which had been cemented to the cuspids and thence to the screw. By turning the screw backward the ligature was tightened, and pressure brought to bear upon the cuspids, which were slowly brought to place. The next step was to cement Magill bands to the laterals. To these bands were attached screws and nuts, the screws extending outward through an opening in a bar, which reached from cuspid to central. This appliance brought the laterals into line.

Dr. Williams.—I simply want to say that I am very glad to see that one principle has become generally recognized,—namely, that rest is as important as motion in cases of regulation.

President Brackett.—I understand Dr. Smith that the ligature used was silk. There was no elastic or rubber in any part of the appliance?

Dr. Smith.—No elastic or rubber. The screw is moved very gradually. I always caution students not to go too fast. You cannot move a tooth as you would a building on the street. With so much power one must be careful. I had a student bring out a lateral incisor from inside the arch in four days. It simply shows

what a student will do if left alone with such an appliance. You can move a tooth more rapidly than you can produce absorption. Teeth should not be moved any faster than absorption takes place, unless the intention be to take advantage of the elasticity of the alveolar and spring it.

Dr. Fillebrown.—Here is the model of a case of bridge-work done some years ago. There are no Richmond crowns in connection with it. The work has proved both useful and durable to the wearer. The patient was about seventy years of age, a man of very nervous temperament, and his teeth were worn short and thin. He had lost an upper first and second molar on both sides, and wished to have something done to make his teeth more useful. The lost molars had to be supplied, and the bicuspsids, being in poor condition, needed crowns. It was out of the question to grind the third molars for the fitting of caps around the margin of the gum. A way occurred to me, therefore, of making a cap and putting it on without grinding down the teeth. I first passed a band of pure gold, about number thirty, around the tooth, and towards the grinding surface added a second thickness of coin-gold. The pure gold was burnished to the tooth when the case was cemented on. The case has proved a very desirable and useful thing for my patient. My confidence in bridge-work is strong, and has grown steadily from the first. I am glad to say that the first case I did, about 1880, has shown good service. It has never been taken off. I know of but few instances where I have had to make many repairs. I have had some failures, from decay of roots of teeth or from absorption of socket. In one or two cases the bridge-work has failed. Less than a half-dozen cases have made me any trouble.

WILLIAM H. POTTER, D.M.D.,
Editor American Academy of Dental Science.

CENTRAL DENTAL ASSOCIATION OF NORTHERN NEW JERSEY.

DISCUSSION ON DR. SWIFT'S PAPER.

(For this paper, see page 168.)

Dr. Hardy.—Dr. Swift's method I think is a very good one, and proves very successful; at least I find it so. In treating cases of this kind it is better to leave the application there and give the

tooth sufficient time to get well before disturbing it again. I do not think you should remove the application in two or three days, for this keeps the tooth in a constant state of irritation; a healthy tooth constantly disturbed becomes more or less irritated. Dr. Swift speaks of treating abscesses by forcing the liquid medicament through the tooth. Instead of that method, I believe in filling the canal entirely and treating the abscess from the outside with peroxide of hydrogen.

Dr. Fish.—This is a subject which possibly no two men in this room to-night can agree upon. In treating these cases I think we have to decide on absolute cleanliness. No matter what course we pursue, whether by coagulants or by the use of essential oils, we arrive at that one point, and in that we will have success.

The essayist claims that in his experience he finds that the essential oils, owing to their rapid diffusibility, will penetrate deeper into the tubuli, and retain, as I understand it, their disinfectant properties longer than an escharotic which is forced into the tooth, and which he claims dams up the tubuli. I cannot say that I agree with him, for the reason that the same identical results have been attained by the use of carbolic acid as that said to be secured by eucalyptus, oil of cassia, and the various other agents mentioned in this paper.

If I wished to place myself in the position of a plagiarist, I might go on and give you a long discourse about my treatment of putrescent pulps, but I have only been in practice three years, and during that time have had very little opportunity to judge of the lasting results of any method which I have pursued. I can only repeat what I said before, that in my opinion the object to be aimed at is absolute cleanliness, be it reached with hot water, bichloride, peroxide of hydrogen, or any other remedy; the fundamental principle rests there.

The essayist, I think, makes an error when, in the treatment of these teeth, he advises the leaving a vent to the cavity. I do not care what antiseptics are placed in a tooth, if he leaves the cavity exposed by a small canal he has a place for septic agents to enter and set up future trouble.

I have found that coagulants work well; I have had better success with the use of these than I have had with the essential oils. And in connection with the treatment, my method is to first clear the roots out thoroughly, and syringe with a solution of bichloride,—about 1 to 500,—using due care not to force anything through the foramen; broaches are not used, or anything that will

act as a piston, which is a most powerful instrument to force agents through the end of the root. I should prefer to use a hypodermic needle, previously removing all the septic matter from the root and drying it thoroughly and wiping it out with coagulants, then using a solution of ether and iodoform. I must admit that there are a great many who object to this method. Possibly some of them may have grounds for the antagonism, but I very much doubt whether there is any solid basis for this. I use a solution. It is very diffusible, and has all the essential elements of a good disinfectant. After treating the canal, I dry it out and fill with chloro-percha, or other filling of that material. So far as I have been able to observe I have had a very good percentage of success.

Dr. George Evans.—Mr. President, I had no idea of talking to-night, but there are one or two points that I may refer to. The subject is, I believe, putrescent pulps, and I will endeavor to discuss the paper, rather than the remarks of other gentlemen who have spoken upon it.

The essayist enforces the necessity of preventing the saliva from entering the pulp-canal. That is a point which is often brought forward. That is very sensible advice in the case of a root-canal from which you have taken a freshly-destroyed pulp, but it makes very little matter whether or not the saliva is permitted to enter a cavity while there is a putrescent pulp present or just removed. What is worse than a putrescent pulp? Is saliva? Not at all. After you have cleared out the canal and commenced your antiseptic treatment, keep out the saliva; but at the beginning of the operation it is almost needless to discuss the question. I believe thoroughly in the use of essential oils. Carbolic acid and creosote have their place in dentistry; they are old-fashioned remedies. Now, it is an undisputed fact that carbolic acid has not the diffusible power in a pulpless tooth possessed by the essential oils, especially oil of cassia. I believe that Dr. Miller in his experience has demonstrated the fact that the oil of cassia, or cinnamon oil, is a more powerful antiseptic agent by far than is carbolic acid.

Iodoform is considered at the present time in dental practice, by those who are studying new methods of treatment and new agents, as one which is ready to be laid aside on the shelf in dental practice; first, because iodoform has no greater power as an antiseptic agent than aristol, and because it is a most disagreeable one to use in the dental office. You can take a saturated solution of any one of the essential oils with aristol and get all the effect of iodine. Place cotton in the canal with a saturated solution of aris-

tol; it is agreeable to the patient, and its action as an antiseptic agent is far superior to that of carbolic acid or creosote. Carbolic acid and creosote differ materially as agents for use in pulpless teeth. Carbolic acid is soluble in water, while creosote is not so readily miscible; and if you fill a pulpless tooth with a preparation of carbolic acid, and seal that up as closely as you can and in any form you wish, or pack it solid if you please, and dismiss the patient for a year, and then open that root-canal and take out that cotton, there will be but little odor of carbolic acid, it having been absorbed in some way, or passed from the root-canal; but where the essential oils are used, mixing them with some one of the various preparations of iodine, there is a permanent antiseptic agent in the root canal, which establishes and maintains an aseptic condition.

The essayist spoke of using a trephine. I am decidedly opposed to that treatment, because if the operator can always tell where the abscess lies, and just where the apex of the root is, he is very expert, more expert than I am, and I think more so than the majority of practitioners. And, aside from the uncertainty of reaching the point aimed at, the operation is a severe one. There is one thing that I cannot understand,—that is, how it is that so few practise the admirable method of entering into the apical space, presented by Professor Black; that is, the use of carbolic acid along with the instrument, and exfoliating the tissue. In that way I can enter the apical space with a minimum amount of pain to the patient. It is performed in this way: The gum is dried, and then with a plugger a drop of carbolic acid is placed directly over the place where the apical space is supposed to be, letting it rest a moment; then commence removing with an instrument the tissue. In a few moments apply another drop of acid and remove as before, repeating this from time to time, and in a short time the alveolar process can be penetrated, and with a burr drill make the entrance direct to the apex of the root.

Dr. Watkins.—Mr. President, I would like to ask Dr. Evans when Dr. Black published that method of using carbolic acid in opening an abscess; about how long since. I thought I was the originator of that method. I described that method before the First District Dental Society of New York eight or nine years ago, and it was published in the *Dental Cosmos*. Up to that time I had never heard it mentioned or seen it in print.

Dr. Evans.—So far as I can I like to give honor to whom honor is due; no one wants to give it where it is merited more than I do. I was not aware that Dr. Watkins had introduced that

method. I referred it to Dr. Black, in a measure, because he has presented it in the "American System of Dentistry," and he has not given Dr. Watkins credit for it.

Dr. Luckey.—I think the credit of introducing this method belongs to our old friend Dr. Atkinson, who performed the operation in New York at least fifteen years ago, and described it many times since.

Dr. Evans.—I have only one word more to say, and that is, if this method is so well known, why is it not practised more?

Dr. Swift.—I have used carbolic acid in the manner described for the past seven years, and also attributed its origin, as Dr. Luckey does, to Dr. Atkinson.

Dr. Ottolengui.—I hope you will pardon my saying that this contention over the name of the originator of any method is a waste of time. It is the method that we want, and not the name of the originator. It does not make much difference to the patient who discovered a particular method so long as the man who is operating knows how to use it. With regard to this process, it seems to me that you are claiming something for very little; because, after all, you only penetrate to the alveolar process with it; passing through the gum-tissue, which is not very sensitive, and then enter the bone, which is not so responsive to the carbolic acid; and after that enter the apical space, the point where pain will be felt; it is the inflamed tissue at the end of the root, the pericementum, that will make the response, and unless the carbolic acid acts upon that and removes the sensitiveness, time is wasted in using it on the gum.

I find that I cannot get along without an ethereal solution of iodoform. And I desire to say that the ethereal solution of iodoform has not the bad odor generally represented. And another curious thing about iodoform is this: I have seen it stated, I think by Dr. Miller, that iodoform is not a germicide to any great extent; nevertheless if you go into a hospital ward you will see five or six yards of iodoform gauze and no carbolic acid. I think if it is good enough for major surgery it is good enough for the minor operations in dentistry. It is not wise to run after every new drug that is put on the market, thinking it is better than anything else that was ever introduced. As long as iodoform serves its purpose it is a good thing.

I want to say a word about the success that has been reported as obtained from the various methods of filling or treating teeth. It is wonderful what an amount of bad work you can do to the

teeth and have them stay there. Whether coagulants or non-coagulants be used, a large majority—I think over eighty-five per cent.—of the teeth will stay in any way; if you do the work with passing skill it will remain, and the teeth will be retained in the mouth until they become abscessed; and who is to know how long it will be until this occurs? There are two classes of pulpless teeth, one in which eighty-five or ninety per cent. of successes are obtained; the roots of these can be entered and without much care. Then there is a separate class having those minute canals in the buccal roots and the anterior roots of lower molars, and I think they make up the other fifteen per cent. I suggested lately, at a meeting in New York, that it might be possible that after the pulps had been taken from these buccal roots we might find some way of leaving the rest in; of course we can leave them, but let us see if we can leave them there with safety. I suggested that perhaps treating liberally with chloride of zinc might mummify or coagulate them. I tried this on a case recently. I removed the usual percentage of the pulp from the palatal root-canal, and did not get anything out of the other two canals. I put in chloride of zinc and left it in for several days, and to my surprise I was able to go a little way up in these buccal roots; how far proportionately I don't know, but I did go so far that I could see the three openings in the canals. I treated once more with chloride of zinc, and at the next sitting filled these canals as far as I could, and in five days afterwards there was a fistulous opening over the buccal canal. The suggestion in that case did not amount to anything.

Dr. Watkins.—I would like to say, before this subject is passed, a word in favor of carbolic acid in the treatment of putrescent pulps. Everything we hear now seems to be in opposition to its use. All have used it, and I keep it in my office, and I use it more than any other medicine, and have more success with it than with any five other compounds. If there is one other agent I want in my office it is iodoform; and in many cases I mix them together and insert them, as in the treatment of putrescent pulps. In a week or ten days after this the tooth is ready to fill without any further treatment. I believe that if the canal be opened and treated thoroughly the first time, in nine cases out of ten that will suffice.

Dr. Sanger.—I would like to say a word in reference to Dr. Evans's root-dryer. I have heard a number of discussions on the subject of putrescent pulps without hearing this instrument spoken of. In my own practice it is invaluable in cases where access to the pulp-chamber is secured. My practice is to follow what is

called the immediate root-filling process, and to do that I have always had recourse to this. Having removed all of the pulp that is possible, I proceed to dry out the root until I get no odor at all. It requires a little patience sometimes, but after thoroughly using this dryer I can close a canal and retire with a clear conscience.

Dr. Eaton.—I am of the opinion that if Dr. Watkins would try eucalyptus instead of carbolic acid, in combination with iodoform, he would find that he would get equally as good success if not better. I have been in practice for nearly thirty years, and I don't know how it is, but somehow I have always managed to get along without opening into the apical space. Perhaps I do not do as well as others, but I always get along without doing that. If I have a fistula I treat it through that channel.

On motion, the subject was passed, with the thanks of the Association to the essayist.



Editorial.

WHITHER ARE WE DRIFTING?

THE changes which have been made in dentistry during the past forty years are well known to the profession at large, and need no reiteration here; but the effect produced may not be appreciated nor fully studied to comprehend whether change means advancement in the best sense, or whether it may not imply a retrograde in many directions. The question that heads this article, therefore, becomes of importance in that the duty is incumbent upon each individual to know whether, as a profession, we are drifting towards higher results in practice.

The age of machinery is upon us, with all its tendencies of good or ill, affecting all the relations of life, and has become an important factor in the changes which have so impressed the practice of dentistry in the period named.

The time antedating the introduction of cohesive gold was one of preparation. It was not an active period in the direction of the introduction of new appliances.

The necessity then existing of formulating methods of procedure was a paramount impulse, and held the thought of that day so

closely that radical changes in instruments were not seriously considered. This could not last, and as years were added to years the inventive mind was led to a multiplication of devices, and labor-saving appliances so extended that it has become difficult for the average practitioner to understand their value or to make use of them in practice.

With the introduction of rubber as a dam, came, unfortunately, the loss of the knowledge how to use napkins. With its use were introduced measures to more effectually retain it in position. With cohesive gold came the requirement for means to accomplish more rapid work and for more perfect consolidation of this material, and the mallet of varied forms was generally recognized as essential. The slow hand-processes gave place to the drill used by power, and the dental engine was a fixture in nearly every office. The separating of teeth by older methods gave way in large degree to instruments of force. The motor has taken the place of the foot, and the end is not yet.

This brief statement, while not covering all the changes made, is sufficient to show that the tendency has been towards rapidity, without thought whether this would result in benefit to the patient, or, indeed, to the real advance of the profession.

It is a truism to say that every piece of machinery introduced has been followed by a loss and a gain,—a loss of the skill required to effect a given result without it, and a gain in a new development of skill in its use and facility in accomplishing more in a given period. This is, or should be, recognized. The balance between loss and gain means the amount of true progress made in any direction.

The question of greatest import to us is not whether, as dentists, we have been benefited physically or financially by the so-called improvements made, but whether our claim to be a body of workers in a branch of the healing art has been well sustained; or whether, in other words, our patients have been, upon the whole, benefited. This question is one too broad to be answered in full in the brief space allotted, but a few considerations may not be out of place to demonstrate, if possible, that change is not always progress, nor is rapidity always conducive to the well-being or ultimate good of those we are called upon to treat.

The older members of the profession of dentistry will doubtless agree with the writer that the period referred to—that antedating cohesive gold—was one in which lesions, now very familiar, were strikingly absent. While this in a degree may be attributed to a

want of true pathological knowledge, it still remains a fact that the dividing-line between the old and the new dentistry brought with it a series of complications, if not unknown, at least very rare, and not constituting a disturbing element in practice.

The introduction of the dam, with the necessity of having it closely fitting the cervical border, involved irritation of delicate tissues. This was further aggravated by the ligature, and subsequently by the clamps introduced. What followed? The impression made by these upon the pericementum meant a local irritation and an introduction of a train of evils of important pathological significance. It would, perhaps, be assuming too much to state that pyorrhœa alveolaris has frequently been produced in this way, but the evidence is sufficient to show that its origin can thus be traced, and, in the judgment of the writer, is more often the cause than practitioners are willing to admit. It may be said in extenuation that, recognizing this to be true, it could only occur in careless hands. This is conceded, but in the hurry of operations it is questionable whether carelessness is not the rule rather than the exception. How many after employing these appliances take the trouble to use antiseptics at the margins of the gums? Perhaps not many, and yet, as a prophylactic measure, this is essential. How many, in forcing the clamp to place, take the trouble to examine whether this impinges on the pericementum? or how many regard with any concern the position of the ligature, often in place for an hour, and even longer? How many view with any anxiety the possible effect of a forceful separation of teeth by the instruments in general use? Do they take into consideration the anatomical structure of parts and the effect of their displacement? Would they in after-years be disposed to charge themselves with any subsequent malarrangement of the teeth? Not many, it is feared, are thus thoughtful; and yet all the contingencies named are among the possibilities, and these might be elaborated to a far greater extent.

The effect of the mallet is so well understood by every operator that it would seem useless to expend many words upon it, yet it is questionable whether many stop in the hurry of practice to think of the physiological disturbances which may be produced by its use,—the shock to delicate organisms, the local effect upon the teeth, the injury to the material used, and the many more or less serious complications which may arise from the severe blows often repeated.

There is a proper and an improper use of instruments, and this applies with almost equal force to the simple as well as to the com-

plex. Every one is valuable and necessary, but to use them correctly means physiological and pathological knowledge, and where this is possessed there need be no fear of injury, where conscience is in command.

We are drifting rapidly more and more into these professional conveniences, and, it is feared, with almost equal certainty into a careless disregard of that higher standard which means the greatest good attainable for the patient, with the least expenditure of physical and nervous energy for the operator.

RESIGNATION OF DR. JOSEPH HEAD.

WE regret to be obliged to announce that Dr. Head has, by press of work in other directions, felt compelled to tender his resignation as assistant editor of this journal. We part with him with great regret, and trust that his present separation from editorial work may be only temporary.

Dr. George W. Warren, of Philadelphia, author of a "Compend of Dental Pathology and Dental Medicine," and chief of clinics of the Pennsylvania College of Dental Surgery, was elected to fill his place. We have every confidence that Dr. Warren will ably second the efforts of the editor-in-chief to increase the value of the JOURNAL, by extending its work and adding interest to its pages.

WORLD'S COLUMBIAN DENTAL CONGRESS.—NEW ORDER OF BUSINESS.

WE publish on another page the order of business as arranged for the Dental Congress. Had it not been received from the constituted authority we should have been tempted to regard it in the light of a burlesque. Whoever arranged it must have supposed that the making of addresses constitutes the chief end of man, for we find every day, excepting Thursday, at exactly 12 m., an "Address before the whole Congress" is in order. On that day (Thursday), in addition to the 12 m. address, the members are to be edified in the evening by a "public address, under direction of World's Congress Auxiliary." It is not surprising, after this wordy

deluge. that on Saturday the members are expected to lunch "in the restaurant."

On Wednesday, at 8 P.M., there is to be a lantern exhibit, and at the same hour, 8 P.M., "*Conversazione*." Are we to understand that the members are to *converse during the exhibit*?

There is no disposition to assume a spirit of criticism, but it does seem that a better arrangement could be made. The time given to addresses should be limited to the first day and the first session, and the other periods to scientific matters. The time is all too short, and the programme, as at present arranged, allows none for discussion, as it will, doubtless, require all of the hours for the reading of the papers presented.

THE PAN-AMERICAN MEDICAL CONGRESS.

WE have received the "Preliminary Manifesto of the Section of Nervous and Mental Diseases" of this Congress, and are requested to state that "every effort is being made to make the meeting of the Section on Diseases of the Mind and Nervous System both scientifically profitable and socially pleasant."

A long list of officers is appended, for which we have not the space.

This Congress, notwithstanding the numerous attractions at Chicago, appears to promise excellent results.

Bibliography.

A STUDY OF THE DEGENERACY OF THE JAWS OF THE HUMAN RACE.

By Eugene S. Talbot, M.D., D.D.S., Chicago, Illinois. Published by the S. S. White Dental Manufacturing Company Philadelphia, 1892.

This book, though comparatively limited in size,—sixty-seven pages,—embodies much thought and critical examination of cases by the author, as well as many others interested in similar studies. It would be unjust to criticise such a work as this by the ordinary methods. Very few have had the experience of the author in the

direction in which he has made his life-work, and, therefore, while some of his conclusions may be at variance with individual opinions, it may be well to remember that they are not based on speculation but on careful, painstaking observations of many years. The adverse criticisms with which this book has been met since its issue has led the present writer to infer that it has crushed some pet theories. This should make it more valuable, for a book that fails to do this lacks the necessary life to justify an existence.

Whatever opinions may be held adverse to his deductions, it seems certain that no one can rise from the reading without having the mind broadened by suggestive thought.

The author's conclusions in the opening pages are not very encouraging for the human race, for it would seem, if he be correct, that in proportion to the extent of intellectual advancement will the race deteriorate, for he says, "Children born of neurotic parents are apt to inherit brilliant minds and very weak constitutions. They are very bright scholars, always standing at the heads of their classes. . . . If they grow up they frequently become geniuses or insane, drunkards, criminals, or egotists." This idea is repeated in the latter part under the head of neurosis, in which he says, "It is a singular fact that there seems to be a fascination for neurotic individuals to seek one another's society. Hence the large number of literary societies which are being formed throughout the country, entertainments, and social gatherings, at which brilliant men and women are to be found." All this is very discouraging if accepted. That it is true we have no doubt, for intelligence must always prefer intelligence to stupidity; but that it leads to the dire results pictured cannot be accepted without qualification. If it be true, there is and always must be but one result,—development from barbarism to a higher cultivation, and, the limit reached in a special line, there is either extinction or a return to barbarism. It is a very discouraging view to take of life, and yet it is to be feared it has stubborn facts to support it.

After quoting many writers to show that the jaws are degenerating, he says, "Actual measurement supports this theory. . . . Evolutionists and scientists have frequently mentioned the fact that the jaws are changing in shape and size; but they have never produced data just to show what changes have taken place. I have, therefore, collected a large number of measurements for the purpose of obtaining facts in regard to these changes. The measurements of the skulls of the early races, as well as modern people, were made from specimens in the museums and crypts of churches in Europe.

Then follows a list of persons in different countries, and sections of this country, who have laboriously aided to make the tables which follow satisfactory by their completeness.

It is to be regretted that, owing to ill health, the author was not able to give careful attention to the proof. There have been some errors in consequence, and it has been requested that in any notice given attention should be called to these typographical errors. "On page 22, where the word Chicago is used, 51 M. and 51 F. should be written. At the bottom of page 18 the number of antero-posterior measurements made by me of seven hundred and twelve male and female mouths of individuals and models are as follows:

	Lowest.	Highest.	Average.
Inches	1.56	2.19	1.84
Mille.	39.69	55.56	46.74

It is necessary to group both male and female, because many of the measurements are taken from plaster casts, so that I was unable to determine the sex."

The temptation is to follow the direction of the author's thought still farther, but space will not permit attention to more than one idea somewhat extensively elaborated in the latter pages. The statement is, that "If all the people of the world lived in cities, the human race would become extinct in two and one-half centuries." If by this is meant, and the text indicates it, that the active life of cities tends to destruction of the race, then there must be a difference of opinion. If "all men lived in cities" life would become impossible, for the soil must be made to bring forth food necessary; and men must be ready to meet this want. The idea, however, that city life, properly conducted, is destructive, is a fallacious one, and is not borne out, as far as the writer is aware, by statistics.

The dental profession and the scientific world at large owe much to Dr. Talbot and his collaborators; but we fear the reward they will receive will not come in this generation, for the average reader is not fond of details of measurement, and will persist in regarding them as very uninteresting reading. This character of work, however, can have no ephemeral life, but will become the basis for more advanced conclusions generations to come.

THE RISE, FALL, AND REVIVAL OF DENTAL PROSTHESIS. By B. J. Cigrand, B.S., D.D.S., Chicago, Illinois.

This claims to be a history of mechanical dentistry, but it can hardly be said to justify the title, or to present the subject in a way

that will prove satisfactory to the student desirous of obtaining the most accurate information.

While it claims to be a compilation of facts, the entire absence of sources of information leads to the suspicion of inaccuracy, and conveys the impression that the author has not carefully tested the truth of his statements.

Notwithstanding this defect, the book is a very readable one, the author having succeeded in investing the subject with interest.

It is extremely unfortunate that, with his apparent care in illustrations and general excellent taste in press-work and paper, he should have neglected careful proof-reading. It has rarely been our privilege to see so much inexcusable carelessness in this direction.

ANATOMY (DOUBLE NUMBER). By Fred J. Brockway, M.D., Assistant Demonstrator of Anatomy, College of Physicians and Surgeons, New York, and A. O'Malley, M.D., Instructor in Surgery, New York Polyclinic. Being Volume I. of the Students' Quiz Series, edited by Bern B. Gallaudet, M.D., Demonstrator of Anatomy, College of Physicians and Surgeons, New York; Visiting Surgeon, Bellevue Hospital, New York. Pocket-size 12mo, 367 pages, 15 illustrations. Limp cloth, \$1.75. Published by Lea Brothers & Co., Philadelphia.

In this presentation of modern anatomy, the authors and editor have done their work well. The essentials of the subject—the knowledge that will be most useful to the student and general practitioner—have been selected and arranged in a concise and compact form. A Glossary has also been prepared, in the hope of promoting a correct pronunciation of anatomical terms.

The typography, however, could be improved upon. In printing text-books a type that would be less trying upon the eyes should be employed. W.

NOTE-BOOK FOR DENTAL STUDENTS. (Dental Anatomy and Physiology.) By James F. Rymer, Member of the Royal College of Surgeons of England; Licentiate in Dental Surgery of the Royal College of Surgeons of England; Doctor of Dental Surgery, University of Pennsylvania. Second edition. London: Claudius Ash & Sons, Limited, 1892.

This note-book of sixty pages was issued in the first edition in 1888, as the author states, "with the express object of proving useful prior to examinations. . . . Accordingly, I have collected together the chief matter connected with dental anatomy and physi-

ology." He further very properly says, "To understand so large a subject in this condensed form, it is necessary that the general text-books should be first mastered."

The notes cover the "Teeth of Man," with their peculiar characteristics; "The Eruption of Teeth;" definition of "Terms as Applied to Types;" "Dental Tissues" and adjacent parts, and the "Development of Teeth." These subjects are succeeded by very compact but clearly expressed notes on "Comparative Dental Anatomy."

The writer knows of no book of its size that comprises so much condensed information. As an aid to memory for those for whom it is specially prepared, the book can be recommended without reserve, and it will also be found a very convenient pocket reference for those of more enlarged experience.

PHYSIOLOGY: A MANUAL FOR STUDENTS AND PRACTITIONERS. By Frederick A. Manning, M.D., Attending Surgeon, Manhattan Hospital, New York. Being Volume II. of the Students' Quiz Series, edited by Bern B. Gallaudet, M.D., New York. Published by Lea Brothers & Co., Philadelphia. Limp cloth, \$1.00.

This well-condensed and systematic work is admirably adapted for students of physiology, and its plain, concise statements must make it useful and convenient to the practitioner. It is not intended to compete with nor to take the place of the more elaborate text-books, but to present the subject in such a manner as to fix in the memory facts already learned in less limited treatises.

The publishers present this series of manuals in an attractive, form, and the type used in this is more agreeable than in Volume I.
W.

THE ANGLE SYSTEM OF REGULATION AND RETENTION OF THE TEETH. (Third edition, revised and enlarged.) By Edward H. Angle, D.D.S., former Professor of Histology and Orthodontia in the Dental Department of the University of Minnesota. Published by the Wilmington Dental Manufacturing Co., Philadelphia. 75 cents.

In this little book we find a great amount of valuable information. Dr. Angle has from time to time given the profession numerous suggestions in orthodontia, treatment of fractures of the maxilla, etc., which are always pre-eminently practical, issuing, evidently, from a practical mind.

We have long ago recognized the superiority of this system of regulation over many of the clumsy and often unscientific appliances in common use, and would recommend a careful perusal of Dr. Angle's work.

W.

Obituary.

EDGAR PARK, D.D.S.

At a meeting of the St. Louis Dental Society, held January 17, 1893, the committee appointed to prepare a memorial and resolutions on the death of Dr. Edgar Park, formerly an active member of this Society, submitted the following report, which was adopted:

In Memoriam.

Died at Middletown, New York, August 12, 1892, Dr. Edgar Park, in the fifty-third year of his age.

Dr. Park was born in Wainfleet, county of Welland, Ontario, April 21, 1840. His family were English people. Up to the time of his leaving home, his education was only such as was obtained from the common or public schools. He left his home at the age of sixteen with but a scanty wardrobe and twenty dollars, bound for Texas, but, owing to his financial condition, stopped at Chicago, where he obtained employment, and, by taking a course in Bryant & Stratton's Business College, made some advance in education and position. Through the influence of and association with his uncle, Dr. Park, of Chicago, with whom he lived, he became deeply interested in the study of medicine, and attended a regular course at Rush Medical College. Later his attention was directed to the special branch of dentistry, and he adopted it as his profession, entering upon a course of study at the Ohio Dental College in the year 1864, and graduating at the Missouri Dental College in 1869.

He was associated in practice with Dr. W. W. Alport, of Chicago, for a short time, after which he came to St. Louis and took a position as assistant to Dr. C. W. Spalding in 1865. In 1867 he became associated with Dr. H. J. McKellops, and remained with him until 1870, when he opened an office of his own. He soon secured a lucrative practice, and was highly esteemed, socially and professionally. In 1873 he was happily married to Mary C. Fisk, an accomplished and lovable woman, daughter of General Clinton B. Fisk.

He continued the practice of his profession until March, 1884, when failing health compelled him to retire, and, after an illness of eight years, died at Middleton, New York, August 12, 1892. His wife and five children (four daughters and one son) are left to mourn the death of a devoted and an affectionate husband and father.

Dr. Park was devoted to his profession, and was often heard to remark that, "If I were worth a million I would never give up the practice."

He was a progressive man, and ambitious to see the professional standard raised and honored; was foremost with those who labored to advance the profession by filling its ranks with capable men. He was a self-made man in every respect,—a man of great natural resources, exquisite literary taste, and extravagantly fond of art, and always longed for the moment when he could have time and means to gratify his taste in this direction.

He was a devoted professional brother, interesting, sociable, kind, and charitable, an active worker in the St. Louis Dental Society, always ready to do his share in whatever position he was called to act. He received the highest honors in the gift of the St. Louis Dental Society.

He was a member of the American Dental Association, and for one year its recording secretary. Also a member of the Missouri State Dental Association. He was at one time a member of the Illinois Dental Society.

Dr. Park was a careful, painstaking, conscientious operator of acknowledged ability, and much of his work stands to-day as a monument to his skill.

WHEREAS, In the death of Dr. Edgar Park, our esteemed associate and active worker, the St. Louis Dental Society has lost one of its most worthy and honored members, a man of sterling professional integrity, full of generous impulses and kindly feeling, therefore be it

Resolved, That this expression of our regard and deep regret be spread upon the records of this Society, and that a copy be transmitted to the bereaved wife and family, to whom the Society tenders its sincere sympathy. Also,

Resolved, That a copy of this memorial and resolutions be sent to the leading dental journals for publication.

WM. H. EAMES,

A. H. FULLER,

WM. N. MORRISON,

Committee.

WM. CONRAD,

Corresponding Secretary.

Domestic Correspondence.

THE PAN-AMERICAN MEDICAL CONGRESS.

SECTION ON ORAL AND DENTAL SURGERY.

CINCINNATI, OHIO, January 31, 1893.

TO THE DENTAL PROFESSION OF THE WESTERN CONTINENT:

The Pan-American Medical Congress, to meet in Washington, D. C., September 5, 6, 7, and 8, 1893, being an assured success, the Dental Section promises to be well represented.

No other section of the Congress can claim a greater number of men of scientific attainment. In artistic and mechanical skill, in accurate and delicate manipulation where surgery is involved, in bacteriology and histology and rapid progress in its specialty, no other surpasses that of the dental profession. Able papers on the following subjects will attest the above assertion: Cleft Palate, Harelip, Orthodontia, Dental Anatomy, Histology and Pathology, New Growths of every character pertaining to the mouth and teeth, Diseases of the Maxillary Sinus and Alveolar Processes, Periostitis, Pulpitis, and their Results, Operative Dentistry, Bacteriology, Mechanical Dentistry, in addition to many other suitable topics.

This Congress being an outgrowth of the American Medical Association, the requirements for membership in this section are identical with that of the A.M.A.,—viz., any reputable practitioner holding the title of D.D.S. or M.D.S. can become a member the same as if he possessed the M.D.

To members of the profession in our sister countries we extend a hearty invitation to visit us and participate in the meeting, either by writing papers or by being present to hear or discuss them. This is especially desirable, since the Congress belongs equally to all American countries. Many of you will, no doubt, visit the great World's Fair. This is also the year for the World's Columbian Dental Congress in Chicago. This meeting, however, in no way interferes with the P. A. M. C., since the Columbian comes August 14 to 19, inclusive, and the P. A. M. C. September 5 to 18, inclusive, in Washington, thus affording two attractions in the way of scientific dentistry in addition to the great Fair. Many of the officers of one Congress are officially connected with the other.

To the Columbian you are an invited guest; at the Pan-American you are participating in an institution as much your own as ours.

To the dental profession in the United States we would suggest that in taking part in this, the first meeting of the P. A. M. C., we are the hosts, and our duties as such need not be rehearsed.

The excess of dental practitioners in the United States over our sister countries will necessitate a careful selection of topics and papers in order to present the highest standard, the object being not numbers, but quality of material and ample time for discussion.

The social feature of the Congress will be no small part of the attractions.

Respectfully,

M. H. FLETCHER, R. P.,

*Executive President of the Section on Oral and Dental
Surgery of the P. A. M. C.*

CORRECTION.

TO THE EDITOR:

SIR,—Will you kindly correct an error which appears in the February number of the JOURNAL, page 127, in the discussion which followed Dr. Kirk's paper on "Crystal Mat Gold?"

I am in a measure responsible for this error, for I did not, it seems, confine myself strictly to the subject of the paper, but in the course of my remarks spoke of Watt's crystal gold. What I intended saying was that I had tried the *crystal mat gold* soon after it was introduced, and was not as favorably impressed with it as Dr. Kirk seemed to be.

I have used Watt's crystal gold more or less for twenty-five years, and consider it one of the best preparations of gold that we have ever had. The only adverse criticism which I made, or could make to it, is that it seems to deteriorate (lose its cohesive properties) more readily than other gold when exposed to the air. I should feel sorry, indeed, to have it understood that I was disappointed or displeased with Watt's crystal gold after all that I have spoken and written in favor of it.

Yours very truly,

EDWIN T. DARBY.

February 13, 1893.

Current News.

ANNUAL MEETING OF THE INTERNATIONAL DENTAL PUBLISHING COMPANY.

THE annual meeting of the stockholders of the International Dental Publishing Company took place at Taylor's Hotel, Jersey City, N. J., on the evening of January 28, 1893.

Representatives were present from New York, Boston, Chicago, Philadelphia, and neighboring places.

The report of the president, Dr. Louis Jack, gave a very full and satisfactory exhibit of the condition of the company, together with that of the INTERNATIONAL DENTAL JOURNAL, during the past year, 1892, and made various suggestions of importance for the future advancement of the work.

The resignation of Dr. Joseph Head as assistant editor was received, and accepted with regret, and a resolution of thanks was extended him for his services.

Dr. George W. Warren, of Philadelphia, was elected to fill the position made vacant by this resignation.

The Board of Managers were authorized to permanently increase the size of the INTERNATIONAL DENTAL JOURNAL to eighty pages.

They were also empowered to create a department for translations, a special sum being appropriated for this purpose.

The general feeling with those present was that the JOURNAL had become indispensable as the organ of the dental profession and that its future must necessarily be dependent upon the interest taken in it by the dentists of the entire country. Its success thus far was felt to be indicative of a growing feeling that a journal independent of cliques, and representing the best standard, must be sustained. To accomplish this purpose it should enter every office in this and other lands; but this desirable end can only be gained by every one devoted to the interests of the dental profession working earnestly to enlarge its influence by increasing its circulation.

WORLD'S COLUMBIAN DENTAL CONGRESS.

NEW ORDER OF BUSINESS.

August 14, Monday.—10 A.M., Meeting of the General Executive Committee. 11 A.M., Opening of the Congress; reading of the resolutions creating the Congress by the Secretary-General. Address of welcome by John Temple Graves, of Georgia; responses; responses from foreign countries. Address of the President. Adjournment. 2.30 P.M., Papers to be read in the sections. 5 P.M., Adjournment.

August 15, Tuesday.—9 A.M., Clinics. 10 A.M., Meeting of the General Executive Committee. 12 M., Address before the whole Congress. 1 P.M., Adjournment. 2.30 P.M., Papers to be read in Sections. 5 P.M., Adjournment. 8 P.M., Bacteriological exhibit.

August 16, Wednesday.—9 A.M., Clinics. 10 A.M., Meeting of the General Executive Committee. 12 M., Address before the whole Congress. 1 P.M., Adjournment. 2.30 P.M., Garden party. 8 P.M., Biology; lantern exhibit. 8 P.M., *Conversazione*.

August 17, Thursday.—9 A.M., Clinics. 10 A.M., Meeting of the General Executive Committee. 12 M., General address before the whole Congress. 1 P.M., Adjournment. 2.30 P.M., Papers before the Sections. 8 P.M., Public address under direction of World's Congress Auxiliary.

August 18, Friday.—9 A.M., Clinics at hospitals and at the Art Institute. 10 A.M., Meeting of the General Executive Committee. 12 M., General address before the whole Congress. 1 P.M., Adjournment. 2.30 P.M., Papers before the Sections. 8 P.M., Dinner to the whole Congress. (Subscriptions by members from the United States only.)

August 19, Saturday.—10 A.M., Visit in a body to the medical and dental exhibits at the World's Fair Grounds. 12 M., Closing addresses to the Congress. Luncheon by members in the restaurant. (Name to be supplied.)

ANNOUNCEMENT OF THE FIRST PAN-AMERICAN MEDICAL CONGRESS.

SECTION announcement of the First Pan-American Medical Congress, to be held at Washington, D. C., September 5, 6, 7, and 8, 1893:

President, William Pepper, M.D., LL.D., 1811 Spruce Street, Philadelphia, Pennsylvania; Secretary-General, Charles A. L.

Reed, M.D., 311 Elm Street, Cincinnati, Ohio; Treasurer, A. M. Owen, M.D., 507 Upper Front Street, Evansville, Indiana; Chairman of Executive Committee, Dr. Henry D. Holton, Brattleborough, Vermont.

Committee of Arrangements.—Chairman, Samuel S. Adams, M.D., 1632 K Street, Washington, D. C.; Secretary, J. R. Wellington, M.D., 1416 Fifteenth Street, Washington, D. C. (Office, Arlington Hotel, Washington, D. C.)

SECTION ON ORAL AND DENTAL SURGERY.

Honorary Presidents.—Dr. José Joaquín Aguirre, Santiago, Chili; Dr. R. R. Andrews, Boston; Dr. E. A. Baldwin, Chicago; Dr. George Beers, Montreal, Canada; Dr. S. B. Brown, Fort Wayne; Dr. Emegdio Carillo, City of Mexico, Mexico; Dr. Wm. Carr, New York; Dr. H. B. Catching, Atlanta; Dr. Geo. J. Fredericks, New Orleans; Dr. Ricardo Gordon, Matanzas, Cuba; Dr. J. H. Hatch; San Francisco; Dr. A. O. Hunt, Iowa City; Dr. Louis Jack, Philadelphia; Dr. H. J. McKellops, St. Louis; Dr. Francis Peabody, Louisville; Dr. J. C. Storey, Dallas, Texas; Dr. J. Taft, Cincinnati; Dr. J. B. Willmot, Toronto, Canada.

Executive President.—M. H. Fletcher, M.D., D.D.S., 65 West Seventh Street, Cincinnati, Ohio.

Secretaries.—Dr. John S. Marshall (English-speaking), Chicago, Illinois; Dr. Ramón Campuzano (Spanish-speaking), Philadelphia, Pennsylvania; Dr. N. Etchepareborda (Tacuari 355), Buenos Ayres, Argentine Republic; Dr. Wilson, La Paz, Bolivia; Dr. Benicio de Sá, Rio de Janeiro, United States of Brazil; Dr. Luke Teskey, Toronto, Canada; Dr. Guillermo Vargas Parédes (Carrera 7, núm. 638), Bogota, Republic of Colombia; Dr. J. Luis Estrada, Guatemala City, Guatemala; Dr. George Herbert, Wailuku Maui, Hawaii; Dr. Rafael Rico (Escuela de Med.), City of Mexico, Mexico; Dr. A. Lacayo, Granada, Nicaragua; Dr. Andres G. Weber (Corrales 1), Havana, Cuba; Dr. Angel Guerra, Montevideo, Uruguay.

EXTRACTS FROM REGULATIONS AND BY-LAWS.

Membership.—Members of the Congress shall consist of such members of the medical profession of the Western Hemisphere, including the West Indies and Hawaii, as shall comply with the special regulations regarding registration, or who shall render service to the Congress in the capacity of foreign officers. [*General Regulation 2.*]

Constituent Countries.—The following shall be considered as the constituent countries of the Pan-American Medical Congress:

Argentine Republic, Bolivia, Brazil, British North America, British West Indies (including B. Honduras), Chili, Dominican Republic, Honduras (Sp.), Mexico, Nicaragua, Paraguay, Peru, Salvador, Republic of Colombia, Republic of Costa Rica, Ecuador, Guatemala, Hayti, Kingdom of Hawaii, Spanish West Indies, United States, Uruguay, Venezuela, Danish, Dutch, and French West Indies. [*General Regulation 7.*]

Sections.—The Sections of the Congress shall be as follows:

(1) General Medicine, (2) General Surgery, (3) Military Medicine and Surgery, (4) Obstetrics, (5) Gynæcology and Abdominal Surgery, (6) Therapeutics, (7) Anatomy, (8) Physiology, (9) Diseases of Children, (10) Pathology, (11) Ophthalmology, (12) Laryngology and Rhinology, (13) Otology, (14) Dermatology and Syphilography, (15) General Hygiene and Demography, (16) Marine Hygiene and Quarantine, (17) Orthopædic Surgery, (18) Diseases of the Mind and Nervous System, (19) Oral and Dental Surgery, (20) Medical Pedagogics, (21) Medical Jurisprudence, (22) Railway Surgery. [*General Regulation 8.*]

Languages.—The languages of the Congress shall be Spanish, French, Portuguese, and English. [*General Regulation 9.*]

Registration.—The registration fee shall be ten dollars for each member residing in the United States, but no fee shall be charged to foreign members. Each registered member shall receive a card of membership and be furnished a set of the Transactions. [*Special Regulation 2.*]

Abstracts, Papers, and Discussions.—Contributors are required to forward abstracts of their papers, not to exceed six hundred words each, to be in the hands of the secretary-general not later than the 10th of July, 1893. These abstracts shall be translated into English, French, Spanish, and Portuguese, and shall be published in advance of the meeting for the convenience of the Congress, and no paper shall be placed upon the programme which has not been thus presented by abstract. Abstracts will be translated by the Literary Bureau of the Congress at the request of contributors, and should be forwarded through secretaries of Sections. Papers to be presented to Sections must not consume more than twenty minutes each in reading, and when of greater length must be read by abstract not exceeding twenty minutes in length. Papers read by abstract may be printed in full in the Transactions, subject to approval by the Editorial Committee. Papers and discussions will

be printed in the language in which they may be presented. All papers read in the Sections shall be surrendered to the secretaries of the Sections; all addresses read in the General Session shall be surrendered to the secretary-general as soon as read; and all discussions shall be at once reduced to writing by the participants. [*Special Regulation 3.*]

Literary Bureau.—The secretary-general may at his discretion organize a Literary Bureau, which shall consist of such number of linguists as he may determine, whose duty it shall be to do all necessary translating for the Congress, compensation for which service shall be determined by the Executive Committee. Certain members of the Literary Bureau may be designated by the secretary-general as an Editorial Committee. It shall be the duty of the Editorial Committee to determine the eligibility of all contributions before the same shall be published in the Transactions, and to supervise the publication of both the Book of Abstracts and the Transactions. All work done by the Editorial Committee and by the Literary Bureau shall be subject to approval by the secretary-general. [*By-law V.*]

THE PAN-AMERICAN MEDICAL CONGRESS.

SECTION ON DISEASES OF THE MIND AND NERVOUS SYSTEM—PRELIMINARY MANIFESTO OF THE SECTION OF NERVOUS AND MENTAL DISEASES OF THE PAN-AMERICAN MEDICAL CONGRESS OF 1893.

ST. LOUIS, January 17, 1893.

TO THE EDITOR OF THE INTERNATIONAL DENTAL JOURNAL:

SIR,—The Pan-American Medical Congress will meet in Washington September 5, 6, 7, and 8, 1893.

I take pleasure in transmitting herewith a manifesto of the preliminary organization of the important Section of Psychiatry and Neurology of the forthcoming Pan-American Medical Congress,¹ with request that you publish the same in your estimable journal, with editorial endorsement and cordial invitation to the medical profession of your section to co-operate in promoting the success of this section of the coming Congress, by suggestion, by offering papers to be read, by promptly signing as members, by

¹ The list of officers accompanying this is too extended for our space, but it covers many of the most prominent names in medicine on this continent.—ED.

letters, and by advice to the executive president of the Section, or to its English-speaking secretary, Dr. A. B. Richardson, Columbus, Ohio.

Valuable papers have been promised from distinguished savants in neurological and psychological medicine, but many more are desired and desirable. The Spanish, French, and English languages will be spoken in the Section, and it is especially desired to secure as good a representation of the profession and make as good an exhibit of the advance in neurology and psychiatry as may be possible.

This, together with a desire for closer confraternity between the profession of the North and South American States, as well as the welfare of our common humanity, of which the approaching Congress will be promotive, are chief among the exalted purposes of this Section.

Physicians who may desire to identify themselves with this Section of the Congress are requested to do so at once.

Fraternally,

C. H. HUGHES,

Executive President Section on Diseases of the Mind and Nervous System, Pan-American Medical Congress.

RECENT PATENTS.

A LIST of recent patents, reported specially for THE INTERNATIONAL DENTAL JOURNAL:

488,634. Dental Filling. William D. Porter, Providence, R. I. Filed May 20, 1892.

489,117. Dental Engine. Frederick H. Berry, Milwaukee, Wis. Filed July 25, 1892.

489,235. Dental Apparatus. Alvan S. Richmond, New York, N. Y., assignor to John S. Huyler, same place. Filed June 12, 1891.

489,416. Dental Engine. Frank K. Hesse, Boston, Mass., assignor to Codman & Shurtleff, same place. Filed June 9, 1892.

489,675. Dental Chair. Aaron P. Gould, Canton, Ohio. Filed February 24, 1890.

490,516. Dental Chair. Eli T. Starr, Philadelphia, Pa., assignor to the S. S. White Dental Manufacturing Company, same place. Filed February 14, 1890.

Trade-Marks. 22,259. Dentifrices. Herman B. Fould, New York, N. Y. Filed November 19, 1892. Essential feature, the word "Ricealine."

22,260. Filling or Cement for Teeth. Robert Richter, Philadelphia, Pa. Filed November 28, 1892. Essential feature, the representation of a shield having the words "Harvard Cement" upon its face, with the abbreviation, word, and letters "Rob. Richter, D.D.S," also applied thereon.

22,296. Tooth- and Gum-Washes. James J. Ottinger, Philadelphia, Pa. Filed November 25, 1892. Essential feature, the word "Zhongiva."

AMERICAN ELECTRO-THERAPEUTIC ASSOCIATION.

THE third annual meeting of this organization will be held in Chicago on September 12, 13, and 14, 1893. A cordial invitation is extended to all members of the profession interested in electro-therapeutics. Arrangements for special rates on railways and at hotels are in progress.

The Committee of Arrangements will be obliged if those who intend being present at the meeting will send their names, the class and amount of accommodation required, titles of papers to be presented, applications for membership, etc., at as early a date as possible. Accommodation should be secured early on account of the crowded condition of the hotels, because of the World's Fair. All communications should be addressed to the Secretary.

The Committee will be glad to furnish any information in regard to the meeting upon application.

The Committee of Arrangements,
FRANKLIN H. MARTIN,
Chairman.

S. C. STANTON,
Secretary.

THE DOUCHE TOOTH-BRUSH.

THE inventive genius in this direction was supposed to have been exhausted in the various forms presented in the market, but the above English device has opened further possibilities in this direction.

It consists of a small reservoir to be placed on the wall, from which leads a flexible rubber tube to be attached to the handle of

the brush. This handle is perforated, and connected with small holes that open in the bristles. The object is to keep a constant irrigation of the brush when in use.

Theoretically it is a most excellent arrangement, and does its work thoroughly; but we anticipate difficulty will be found in controlling the stream of water, to prevent it running down the handle. In other respects it is a cleanly and efficient device. It is for sale by George B. Evans, 1106 Chestnut Street, Philadelphia.

ALUMNI NEW YORK COLLEGE OF DENTISTRY.

At the annual meeting of the Alumni Association of the New York College of Dentistry, the following gentlemen were elected to office:

President, Sherman B. Price, D.D.S., 1880, 13 West Thirty-second Street, city of New York; First Vice-President, M. Charles Gottschaldt, M.D., D.D.S., 1882; Second Vice-President, H. J. Parker, D.D.S., 1883; Secretary, Vincent M. Munier, D.D.S., 1888, 102 West Ninety-fifth Street, city of New York; Treasurer, Zachary T. Sailer, D.D.S., 1880, 40 West Thirty-third Street, city of New York.

Executive Committee.—Chairman, J. Howard Reed, D.D.S., M.D.S., 120 West Eighty-seventh Street, city of New York; E. S. Robinson, D.D.S.; F. A. L. Wallin, D.D.S.

VINCENT M. MUNIER,
Secretary.

ODONTOGRAPHIC SOCIETY OF CHICAGO.

At the annual meeting of the Odontographic Society of Chicago, held at the Commercial Hotel, Monday evening, December 12, the following officers were elected for the ensuing year, viz.:

President, R. B. Tuller; Vice-President, G. J. Dennis; Corresponding Secretary, T. A. Broadbent; Recording Secretary, U. G. Poyer; Treasurer, Edmund Noyes.

Board of Directors.—R. B. Tuller, U. G. Poyer, H. H. Wilson, O. E. Meerhoff, D. M. Gallie.

Board of Censors.—G. N. West, F. K. Ream, F. H. Zinn.

T. A. BROADBENT,
Corresponding Secretary.

NORTHERN OHIO DENTAL ASSOCIATION.

THE Thirty-fourth Annual Meeting of the Northern Ohio Dental Association will be held in the Council Chamber at Akron, Ohio, May 9, 10, and 11, 1893. Session begins at 10 A.M. Tuesday. You are cordially invited to be present.

THE ST. LOUIS DENTAL SOCIETY.

THE annual meeting of the St. Louis Dental Society was held at the office of Dr. J. B. Vernon, January 3, 1893. The following officers were elected for the ensuing year:

President, Dr. De Courcy Lindsley; Vice-President, Dr. J. Warren Wick; Corresponding Secretary, Dr. William Conrad; Recording Secretary, Dr. J. G. Pfaff; Treasurer, Dr. Henry Fisher.

Committee on Publication.—Dr. L. A. Young, Dr. P. H. Isloeffel, Dr. C. L. Pepperling.

Committee on Ethics.—Dr. H. M. Baird, Dr. A. J. Prosser, Dr. M. C. McNamara.

Committee on Membership.—Dr. W. N. Morrison, Dr. C. L. Hickman, Dr. J. H. Spalding.

Drs. A. H. Fuller, J. W. Wick, and W. M. Bartlett have been appointed a committee to arrange for a series of clinics in operative and mechanical dentistry, to be given in St. Louis on Wednesday, Thursday, and Friday, March 15, 16, and 17 next.

It is the intention of the Society to make this one of the most interesting and instructive meetings ever held in the West.

They want every reputable dentist in the country who can, to be present. There will be a chance to show what they have that is new, and see what others can do.

The clinics will be first-class from start to finish.

SPECIAL NOTICE.

THE St. Louis Dental Society will hold a three days' clinic March 15, 16, and 17, 1893. A general invitation is given for all dentists to attend. The committee having charge of the clinic already promise an interesting meeting. Drs. A. H. Fuller, J. Warren Wick, and W. M. Bartlett compose the committee.

WM. CONRAD,
Corresponding Secretary.

OHIO STATE DENTAL SOCIETY.

At the Ohio State Dental Society, held at Columbus, December 6-9, 1892, the officers elected were as follows:

President, G. H. Wilson, Cleveland; First Vice-President, Chas. Welch, Wilmington; Second Vice-President, W. H. Todd, Columbus; Secretary, L. P. Bethel, Kentucky; Assistant Secretary, Henry Barnes, Cleveland; Treasurer, Chas. J. Keely, Hamilton.

L. P. BETHEL,
Secretary.

Selections.

A NEW COCA BASE AS A LOCAL ANÆSTHETIC.

DR. A. P. CHADBOURNE (*Therapeutic Gazette*) says:

A new coca base has recently been isolated by Giesel from the leaves of the small leaved coca plant of Java. Liebermann has proved that this base is benzoyl ϕ tropeine, which bears no relation to the cocaine group, but is chemically closely related to atropine.

In its local action the new alkaloid is a connecting link between the true local anæsthetics (cocaine) and the "anæsthetica dolorosa" of Liebreich.

In the experiments now described, the hydrochlorate of benzoyl ϕ tropeine was used, the alkaloid itself being insoluble in water. For brevity the name "tropsin" is here given to the drug.

Experiments on frogs show the following chief differences between tropsin and cocaine:

1. Tropsin is less than half as toxic as cocaine.
2. It also produces local anæsthesia more rapidly.
3. Individual susceptibility to the drug varies but little, and so unexpected poisoning from a small dose seldom, if ever, occurs.
4. Recovery is quicker from tropsin than from cocaine.
5. Symptoms of irritation do not follow its use.

Experiments on rabbits show:

1. But slight individual susceptibility to its toxic action. There is, however, some individual difference in the nerve-centres most affected in different cases.
2. Tropsin is much less than half as toxic to rabbits as cocaine.

3. Cardiac depressant action is also less marked, and even after stand-still has been produced the heart may be recovered by electrical stimulation.

4. Complete anæsthesia is more quickly produced by tropsin, but is of shorter duration.

5. After instillation into the eye, a slight hyperæmia may be produced for a few moments, but no other signs of irritation, and no ischæmia.

6. Mydriasis is inconstant and slight.

7. A toxic dose of tropsin produces, like cocaine, a marked rise of temperature.

8. Daily repetition of the dose causes marked diuresis, but urine is normal save for low specific gravity and pale color.

Practical Tests on the Human Subject.—Professor Schweigger, of Berlin, after several months' experience with tropsin in eye surgery, reports that—

1. A three-per-cent. solution produces complete corneal anæsthesia more rapidly than cocaine. Iridectomy could be done painlessly two minutes after putting three drops into the eye.

2. Anæsthesia lasts from three to six minutes for each instillation, and no further prolongation can be produced save by a fresh dose.

3. Mydriasis is absent, or but slight.

4. Ischæmia never occurs, but sometimes there is a passing slight hyperæmia, and a little smarting unless normal saline solution be used as a solvent.

5. No injurious symptoms were ever observed.

6. In removal of foreign bodies, tropsin seems, from its quicker action, far preferable to cocaine.

Dr. Silex, assistant in the Polyclinic, has obtained similar results, and has painlessly performed tenotomy within half a minute from applying a three-per-cent. solution of tropsin.—*American Lancet*.

DR. FRIEDRICHS ON NITRATE OF SILVER.

[In the proceedings of the American Dental Association of 1879, Dr. Friedrichs, of New Orleans, read a paper on "Erosion of the Teeth," from which we make the following extract.—ED.]

AFTER quoting from Dr. Garretson to prove the teeth have a vital action and recuperative power, he says, "Now, from the above premises it is self-evident, if we can bring assistance to the inherent vital force of a tooth, this disease—*erosion of the enamel*—can be

cured. The agent to accomplish it is nitrate of silver, for when applied to an eroded part of a tooth it puts forth its fiat and says, 'So far shalt thou go and no farther.' The salt, when brought in contact with the organic matter of the teeth, is decomposed; the oxide of silver is deposited,—an insoluble and inert substance,—which protects and relieves these portions of the teeth of their hypersensitiveness, antagonizes the action of the morbid influences, and assists the '*vis medicatrix naturæ*' to eradicate the disease. The method of using it is to chip from a solid stick of nitrate of silver a piece about the size of a pin's head, applying this to the eroded part of the tooth, moving it over the surface until dissolved or decomposed, taking care to keep it from coming in contact with the gums as much as possible. If after a week's time the sensitiveness to the touch has not been allayed, the application must be repeated at intervals until this is attained. No danger need be apprehended of its too frequent use, as no injury to the teeth can possibly ensue, for the escharotic operation of lunar caustic is always superficial, and it is almost impossible to make it act to a great depth. The salt produces, along with its excitant effect, contraction of the tissues; or, in other words, acts as an astringent, and this property also constitutes one of its therapeutic recommendations."

OXYCHINASEPTOL, OR DIAPHTERIN.

LEMBACH and Schleicher (*Correspondenz-Blatt für Schweizer Aerzte*, November 1, 1892) report the discovery of a new antiseptic. As a germicide it is better than phenol and lysol in the form of a two- or three-per-cent. solution. Instruments that are not nickelled are blackened by its use. It has the advantage over carbolic acid from the fact that it is easily transported, either in the form of powder or tablets, and its peculiar yellow color prevents it being mistaken for any other preparation. It is chemically clean and its action easily controlled. The preparation is not poisonous. A watery solution is perfectly clear, and there is no evaporation. Kronacher recommends its use in surgery in strengths of one-half- to two-per-cent. solutions. It is a most excellent dressing in cases of burns. There is never any irritation about the edges of wounds after its use, but occasionally patients complain of a slight burning sensation. The solutions do not affect the hands of the operator as do sublimate and carbolic solutions. Its greatest application is to be found in the treatment of nasal and aural troubles.—*University Medical Magazine*.

ASAPROL.

STACKLER (*Bulletin Générale de Thérapie*, 1892) has a note on his new antiseptic. Asaprol is a calcium salt of naphthol and monosulphonic acid, and occurs in the form of a white powder, very soluble in water and alcohol. The tests for its presence in the urine are the same as those for naphthol. Asaprol is a toxic to rabbits in the proportion of fifty centigrammes to each kilo of body weight. Smaller doses are well borne. It has been tested clinically in two cases of influenza, with high temperature and great pain, with the greatest success. In one case all symptoms were relieved in thirty-six hours, and in the other in forty-eight hours, although quinine and antipyrine had been given without avail. The drug proved equally efficient in the various forms of rheumatism, especially in the acute articular variety.

The drug has also been used with good results in gout, asthma, furunculosis, anthrax, various infective conditions, tonsillitis, etc. Gradually increasing doses are recommended. Thus, for adults the dose will be two grammes on the first day, three on the second, and four on succeeding days, to be again gradually reduced when the anti-thermic action has been obtained. The drug should be given with plenty of water, so as to encourage diuresis. It may also be given by the rectum in doses of from two to seven grammes. The drug is incompatible with alkaline iodides, sulphates, and with most of the alkaline salts.—*University Medical Magazine*.

AGATHIN—A NEW ANTI-NEURALGIC.

Ross (*Deutsche Medicinische Zeitung*, No. 50, 1892) reports his results of the use of agathin in relieving pain. It produces no evil effects by long-continued use. It is tasteless, insoluble in water, but soluble in alcohol and ether, and melts at a temperature of 74° Celsius. The best results are obtained by the use of one-half gramme three times daily. In the pains of neuralgia and rheumatism it is especially valuable. Often from four to six grammes are required before the full effects are noticed.—*University Medical Magazine*.

THE International Dental Journal.

VOL. XIV.

APRIL, 1893.

No. 4.

Original Communications.¹

A CONTRIBUTION TO THE STUDY OF EROSION.²

BY J. MORGAN HOWE, M.D., NEW YORK.

IN presenting the subject of erosion for your consideration this evening, it is more with the hope of eliciting valuable information than adding much myself to the knowledge of the subject. If, however, we make record of all that is observed by us, the aggregate of our facts may soon enable us to have more definite ideas of the etiology of this singular waste of dental tissue.

I think it will be of some service for us to hastily refer to some of the observations of a few of those who have made suggestions or written on this subject.

Twenty years ago Dr. Charles R. E. Koch, of Chicago, in an exhaustive paper, said, "At this time the most general belief undoubtedly is that the disease is a process of chemical dissolution." He also quotes Charles Tomes's citation of an observation of Dr. Murie's that the teeth of a sea-lion had been thus wasted in localities least exposed to attrition.

Dr. L. G. Noel, of Nashville, from the medical point of view, wrote in 1875 that he had observed erosion as one of the results of chronic rheumatism.

¹ The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

² Read before the New York Odontological Society, January 17, 1893.

In 1879, Dr. R. Finley Hunt expressed the opinion that erosion was caused by an alkaline condition of the oral fluids.

In 1881, in the discussion of a paper read before the American Dental Association, Dr. Litch said that erosion unquestionably required "a vital condition of the tooth-structure for its development," and that he had never seen it occur in a devitalized tooth. And Dr. G. H. Cushing corroborated the statement as to the immunity of such teeth.

In January, 1884, in the discussion of a paper by Dr. E. T. Darby, Dr. Guilford said that when pulpless teeth are found eroded, "it has probably taken place before the teeth lost their vitality." Dr. Darby said that he had one case of erosion in a pulpless tooth, but the next year,—1885,—the same subject being under discussion, Dr. Darby said that he was not sure whether the erosion occurred before devitalization or afterwards. In the latter discussion, Dr. James Truman proposed the theory that acid secretions from the mucous follicles of the lips were the immediate causes of erosion, and that this action took place mostly at night.¹ He suggested that the discovery of the condition was to be made by testing with litmus paper in the morning on rising.

In 1886, Dr. Kirk, in a paper on this subject, said that the idea

¹ Dr. Truman's position here is not clearly stated, there being a natural misinterpretation of what he attempted to prove.

The examination of many cases of erosion had failed with him to demonstrate either an acid or an alkaline action. The testing of the oral secretions during the day hours gave no positive response. This led to an examination at night, and immediately on rising in the morning. The results demonstrated a marked acid reaction in every case.

The well-known fact that the salivary glands are inactive during hours of rest led to the conclusion that the process of fermentation proceeded during that period undisturbed by the flow of the alkaline saliva. With such a condition there could be but one result, the production of a decalcifying agent. That this was acid was demonstrated by the tests, and, further, there is no evidence to prove that ordinary alkaline fluids have any effect on enamels.

The action of the lip, according to his hypothesis, was purely mechanical, holding the secretions in close contact to the teeth during the night, and acting as the polishing agent through the day.

Dr. Kirk, confirming Dr. Truman's investigations, carried these further by demonstrating the extreme acidity of the secretion of the mucous follicles of the lip, thus adding another factor in the destruction.

It is at present Dr. Truman's opinion that the fermentation at night, with its resulting acid product, has never received the attention that it merits. It is, in his judgment, important as a pathological factor in all forms of tooth destruction, and cannot be set aside as an element of no value.—Ed.

that alkalis produce erosion "is easily disproved by subjecting teeth out of the mouth to alkaline solutions. He was impressed with the suggestions and experiments of Dr. Truman, and he had repeated and confirmed the latter. His conclusion was that erosion "is caused by the solvent action of the acid secretions," and is in no way dependent on mechanical abrasion.

In 1888, Dr. W. D. Miller reported the result of an experiment in a mouth where erosion was progressing, in which, he said, although we have all seen pulpless teeth presenting erosion, "we have not been able to say that these erosions were not produced while the pulp of the tooth was still alive." His experiment consisted in setting an inlay of ivory in an eroded cavity, with the result showing distinct horizontal furrows with a finely-polished surface in the ivory, about two years later.

In 1890, Dr. Miller recorded the effect of the action of a five- to ten-per-cent. solution of caustic potash, on teeth left in the solution some weeks; stating that the ends of the roots could be crushed in the fingers, and easily cut with a knife. He remarks that "attempts to account for erosion by the action of decalcifying agents have not thus far led to a satisfactory solution of the question, and it might be well in future, while searching for the cause, to bear in mind that the teeth may be acted upon by agents which attack primarily the organic, as well as by those which attack only the inorganic, constituents."

Professor J. E. Garretson has favored the electro-chemical theory of Mr. Kencely Bridgman, and expresses the opinion that there must be a predisposition, the result of an impression made on the enamel at the formative period.

These few references to the opinions expressed during the last two decades present two salient points for notice. First, the radical differences of opinion expressed, and the contradictory evidence offered, as in Dr. Kirk's easy disproof of the suggestion of destructive action being due to alkaline fluids, and Dr. Miller's experiment seeming to prove to his mind that alkaline solutions were worthy of consideration as active agents.

But the other and more noticeable point in these quotations is the constantly recurring idea that the vitality of the dental tissues was in some way a factor in the destructive process, and a frequent expression of doubt whether pulpless teeth were subject to erosion. I fell into this error myself several years ago, and proposed that the nutrition of the teeth was probably concerned in the disease.

And although Dr. Miller's experiment—in which he obtained eroding action on ivory in the mouth—was relevant, it was hardly to be regarded as conclusive. It was, therefore, with unusual interest that I observed in the mouth of Mrs. N——, in February, 1892, the erosion of a pulpless central incisor, together with similar effects on several other incisors having living pulps.

I had seen this lady's teeth ten months previously, and knew that there was no erosion. There was a history, meantime, of vital depression, with general hyperæsthesia, and in the latter the teeth sympathized. Again, within the last two weeks, I have seen on the teeth of Mrs. H—— the beginning of erosion on the superior left central,—with a vital pulp,—and also on the pulpless right lateral. There has never been any gingival recession or erosion in this lady's mouth, but both of these lesions have affected these two teeth within the past year under my personal observation. There is a history of rheumatism of many years' standing, causing much suffering when she was sixteen to eighteen years old, but since that time it has been less acute and severe, although seldom remaining many months without some painful symptoms. The past year has not been markedly worse than several previous ones in this respect.

The observation made in these two cases that pulpless teeth are subject to erosion came to me as the revelation of a fact that I had not been aware of, and which the records show has been the subject of much doubt with others; but further back I have found it stated, in Maury's *Dental Surgery*,—1843,—that Dr. E. Parmly had recorded an observation as settling this question “beyond all doubt,” that “a gentleman who had lost his teeth, partly from this cause came to us about four years ago . . . to procure artificial substitutes. A set of human teeth of the best quality were accordingly provided, which, in the course of three years and a half, on his return to us, were found to be grooved from the surface to the central cavity;” and this same reference to Dr. Parmly's record is made to-day in Harris's “*Principles and Practice*.” So that this fact,—that pulpless teeth are subject to erosion,—which has been a point of considerable speculation and assumption for years, and which I supposed I had made an original observation upon, was quite fully settled by Dr. Parmly's observation of fifty years ago. We may positively exclude, then, all further consideration of the vitality of the eroded tissue, or of its nutrition, as being a factor in its destruction. And we are able to confine our attention to the quality of the fluids of the mouth, which must be—it would appear

—the immediate cause of the solution of the tissue. That is to say, we may hope to find in the oral fluids an explanation of their solvent action, but the etiology of erosion, of course, is to be sought for in general systemic conditions.

In the case of Mrs. N——, before referred to, I tested the reaction of the labial mucous membrane with blue litmus, and furnished her with paper to make tests, in the morning on rising, and at other times. The result was that a decidedly acid reaction was almost always shown, and this was somewhat more pronounced in the morning than at other times. This was, I think, the first time I had obtained a decidedly acid reaction in such cases, although I had made tests many times; but, while considering the case, I placed a piece of blue paper under my own lip, with the result that when it was moistened with the mucus it showed as distinct acidity as the reaction from the mouth of Mrs. N——. I repeated this test in my own mouth many times, on different days, and with varying intervals, always getting some sign of acidity and often very decided change of the blue to pink, and there had never been any erosion in my mouth. This being in February last, I waited for results in my own case, thinking that perhaps erosion would appear on my teeth.

Upon the appearance of the new case of erosion on the teeth of Mrs. H——, before referred to, I tested the mucus of her labial mucous membrane, as in the former case, and was not able to get quite so distinct acid reaction at any time, as in the former case, and most of the tests made in her mouth, even in the morning on rising, showed little or no acidity. While obtaining these latter tests I again made a series of tests of the mucus from my own lip, and found it quite acid on many different days. The tests in the morning on rising seldom showed any acidity; but in the forenoon, between ten and twelve o'clock, there was almost always decided acid reaction. My general health has been good during the past year, and there is as yet no erosion of my teeth. I give these facts for what they may be worth, but they appear to suggest much doubt as to the significance of mere acidity of mucus; at least it is shown that the latter quality may exist without erosion occurring very speedily.

An interesting and important question is raised in connection with the consideration of this subject,—namely, how can we tell when the process of erosion has stopped? I have seen cases of erosion in which it seemed to me that for several years there was no destructive progress made, but it was never so certain that I

could positively claim that the disease was arrested. If one or more eroded cavities are filled, the filling-material often furnishes a means of measuring the rate of destructive progress, or the fact of its arrest; but without such means of mechanical measurement, I think the determination doubtful. Eroded teeth that are sensitive to irritating agents have seemed to me to waste sometimes more slowly than some others that were very little, if at all, sensitive. Is sensitiveness of the wasted surface a guide to the determination of the progress of the disease?

In May last, Dr. H. C. Meriam said, in a meeting of the American Academy of Dental Science, that he had two years previously "completely cured a case of erosion by the use of a wash." I have written Dr. Meriam about this case, and a portion of his letter in reply is presented to add to the interest of the discussion of this subject. But, valuable as his suggestions and his testimony are, there arises the question, How does he *know* when erosion is stopped?

Dr. H. C. Meriam.—What is the state of the blood of the patient? In some cases I have seen the patient was rheumatic. In rheumatism the blood is acid, so much so that bad cases smell sour; uric acid is found on the skin. "Through the skin are exhaled the watery parts of the blood." "The mucous membranes have a striking analogy with the cutaneous tissues in organization and diseases." The above from Dunglison's Medical Dictionary. It would be interesting to know if the watery parts of the blood are acid in diseases of the skin. A dermatologist might give us some light on this.

When the case reported at the meeting of the American Academy of Dental Science, in May last, came to me, I was struck by the appearance of the surface of the teeth, resembling that of some large pearl shells that I cleaned with acid when a boy; and also a bad case of erosion that I had seen due to excessive use of lemons. I had never accepted Dr. Tucker's theory of the action of tannin on the teeth, but believed the benefit derived, if any, to be due to its action on the glands of the mouth.

The surfaces of my patient's teeth looked like cathedral glass, and it seemed to me that they were being acted on by acid over their entire surface; no labial or buccal cavities were forming, the action being limited, as far as I could see, to the upper front teeth.

What should I do? Direct an alkali which would clear the mouth for a time, or attempt to change the character of the excre-

tions by treating the mucous glands. I therefore directed my patient to use alcohol three times a day, using enough to get a burning sensation, thus giving tone to the membrane, and getting a glow, just as we do after a cold bath. It would seem we should extend our inquiries to the general system and try to act with the family physician if general conditions are noticed. I do not wish to commit myself to alcohol or anything as a specific, but I have one grateful patient, and shall continue to use it, holding myself ready to change as truth advances.

I am disposed to think the glow that follows its use to be the valuable part of the treatment, and perhaps we may find an agent of more value than alcohol. The condition of the blood in fevers, rheumatism, and uterine disturbances should, I think, be looked into, and a physician, who had made a special study of rheumatism, would, I think, be able to help us.

TWISTED WIRE FOR REGULATING TEETH.

BY WILLIAM SLOCUM DAVENPORT, D.D.S., PARIS, FRANCE.

FIG. 1 represents the mouth of a young lady, seventeen to eighteen years of age.

The superior teeth articulate with those of the lower jaw,—one cusp is too far forward, and the inferior front teeth are flattened backward, while their cutting-edges arch upward until the incisors nearly touch the palate.

The bicuspid region in the lower arch is broad enough to conform to, and permit the teeth to articulate with, those of the upper jaw.

The vault is very high.

The upper lip covers about one-fourth the upper teeth, and the lower lip falls far back and under the superior incisors.

In the history of the case we find,—

1. The patient, until four years old, had the habit of sucking her thumb, with its palm side placed against the roof of the mouth.

2. She was a constant sufferer from adenoid growths and bronchitis, on account of which the tonsils had been incised at the twelfth year.

3. She was a mouth-breather.

4. No similar deformity could be found among any of her relatives.

The first means employed towards correcting the irregularity was to push forward the lower incisors by the use of *linen tapes*, acting as wedges between these teeth and a corresponding edge of a plate which was fitted over the molars and bicuspid.

When this was accomplished a simple rubber retaining-plate was inserted, and the patient left Paris for the winter.

It was my intention, upon the patient's return, to spread the upper arch and attempt to jump the bite, but it was finally deemed more practicable in the *present* case to draw the upper teeth backward, and, to obtain the necessary space, the two superior first bicuspid were extracted. An appliance (Fig. 2) was then made, consisting of a rubber plate, which covered the upper back teeth. Into the right side of the plate was vulcanized one end of a half-round platinum wire, which was passed around in front of the incisors and terminated in a loop at the free end. Two little hooks were soldered to the front of the band in such a way as to catch over the ends of the centrals when the plate was in the mouth, and prevent the wire slipping up against the gums. Into the left side of the plate a staple was vulcanized.

When the plate was in position a copper wire was passed through both the loop and staple, and had its ends brought together and twisted, this producing pressure upon the centrals, laterals, and cuspids.

From time to time another twist was given to the copper wire, until, at the end of seven weeks, the teeth were in the desired position.

A retaining fixture was then placed, consisting of a strip of pure gold, No. 5 to 6 Stubbs, and French gauge, so bent and soldered as to form a loop at each end.

Having previously separated the teeth with linen tapes, the looped strips were covered inside with thick chlora-percha and passed around the anchor-teeth, allowing the loops to be on the outer sides.

Copper wire was passed through these loops, and the ends of the wires were brought together and twisted (Fig. 3) until the pure gold bands were perfectly swedged to the convexity of the crowns, forcing the superfluous chlora-percha out at all points and making an accurate fit. (These bands did not move until taken off four months later.)

Copper wires were fastened to the loops left in the band at the

FIG. 1.



FIG. 5.



FIG. 2.

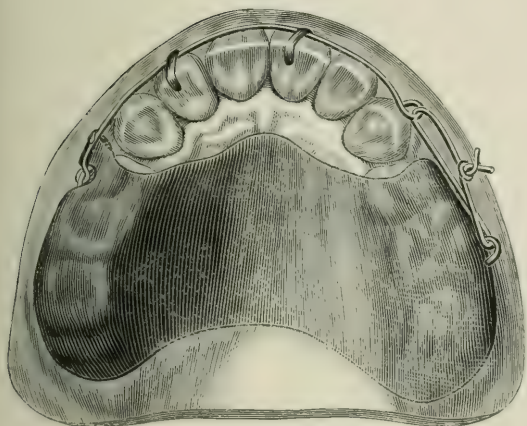
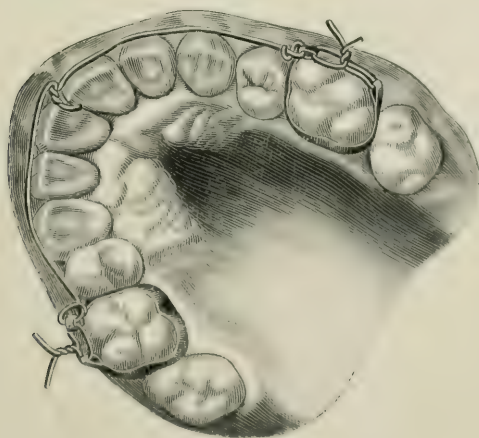
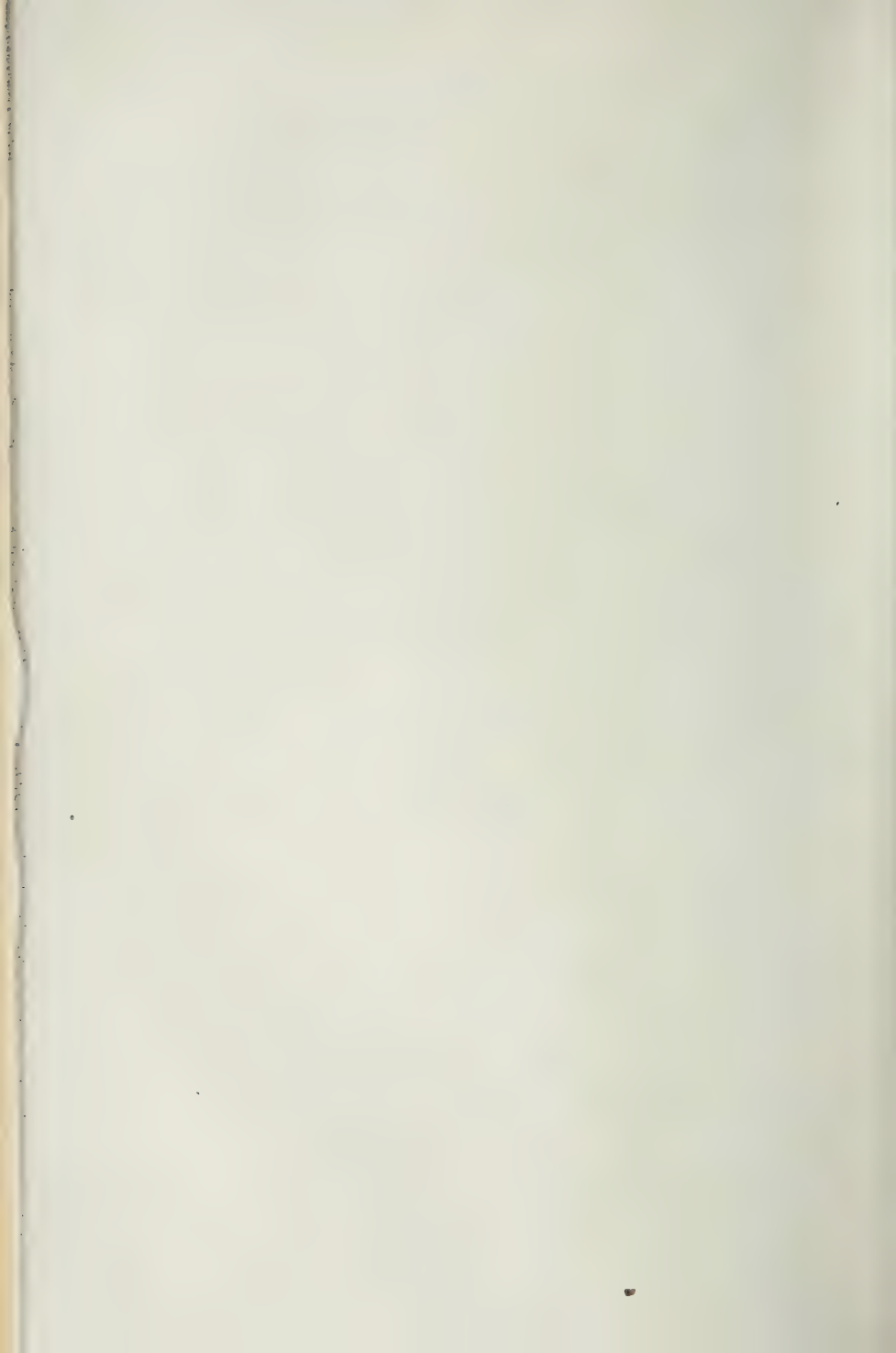


FIG. 3.



FIG. 4.





buccal surfaces of the teeth, and brought around the front teeth from both sides and twisted together at the centrals. This drew the six front teeth to their exact places. The twisted ends were then bent over the cutting-edges of the centrals, to protect the gums from the wire. All rough places at the sides were then covered with gutta-percha.

Fig. 4 shows retainer in position.

By comparing Fig. 5 with Fig. 1, we find the six front teeth were drawn directly backward.

The patient was instructed to remove the plate while eating, and by so doing a very good articulation at the finish was secured.

Positive and intermittent force is secured by such a use of twisted wires as above indicated. The principle involved is that of the inclined plane, which is also the principle made use of in the screw.

Appliances dependent upon twisted wire for the application of force are easily made and applied, and possess many obvious advantages over the screw in very many cases. Wire of silver, galvanized iron, or copper, owing to their pliability, strength, and cheapness, will be found very satisfactory.

EROSION OF THE TEETH.¹

BY SAFFORD G. PERRY, D.D.S., NEW YORK.

IN the development of dental theory and practice, it is fair to assume that those questions which are easiest are the ones that are settled first. It follows, of course, that those which are hardest must be settled last.

It took a long time, and engaged the earnest efforts of acute observers in all parts of the world, before the cause of dental caries was understood. It took even a longer time before it was possible to account for the severe inflammations that often occur about the roots of dead teeth.

The diversity of views in reference to the cause of erosion of the teeth is conclusive evidence that it is not yet finally decided. The conditions are such that it cannot be an easy question to settle.

It is not surprising that there should have been, and should still

¹ Read before the New York Odontological Society, January 17, 1893.

be, such a diversity of opinion as to its etiology. Probably no question in dental practice has been written upon or discussed with such a feeling of uncertainty as to the truth of the particular theory advanced. It must have been perceived that those who have written or spoken on the subject during the last ten or fifteen years have felt that they were groping in the dark; and if they seemed to believe they were not, there was yet such a lack of converging and convincing evidence in support of their particular theory that it is safe to say by common consent the question of the cause of erosion is considered still unsettled.

The earliest observers, exercising their common sense, believed it due to acid action. The latest authorities, profiting by an acquaintance with all the observations that have accumulated, have gone no further.

All along the line, while there has been a preponderance of belief in acid action, there has been, so far as I have been able to learn, no demonstration and no agreement as to what the acid is, or as to what are the conditions, constitutional or otherwise, that produce it.

Without taking the time, in an impromptu discussion of this kind, to give the different theories that have been advanced from time to time, I believe this will be accepted as a fair statement.

In the very nature of the case, until we are able to apply a more accurate system of tests and employ a more trustworthy and convincing method of observation, we shall have to accept, as has been done in the past, such a theory as seems in accord with the largest number of facts we are able to obtain. Each person who has spoken or written on the subject, up to the present time, has very naturally adopted and advanced that theory which seemed to him to account most satisfactorily for the conditions he had observed.

I will now give my idea of the cause of erosion, but you will doubtless perceive something of the same feeling of uncertainty that I have alluded to as characterizing the opinions of others. I am not able to produce facts enough to entitle me to speak with scientific assurance, but I have accumulated evidence which seems to me so reasonable and so consistent that I shall venture to formulate a "theory."

I know that science deals with facts, not theories, and speculation is somewhat out of place in scientific discussion, but in the absence of positive knowledge I think its employment is a legitimate means of searching after truth. It has always been employed more or less by scientists, and naturally so, for all down the ages, men,

when brought face to face with the unknown, though they have felt like helpless children, have yet craved an explanation of what they could not understand, and, in their inability to attain this, have derived some satisfaction in accepting as true that which seemed to be true. Many of the important truths of medicine have had to be accepted first in this way. If, in the language of the poet, "it is better to have loved and lost than never to have loved at all," so I think it may be better to accept a theory which yet may be destroyed than to have no theory at all.

In our daily practice it may serve a good purpose, as it may give us the courage to adopt a positive line of treatment, and it may infuse an indefinable confidence that in itself may help us to attain results that might not be reached if, not knowing our own minds, we drift about like a ship at sea without a rudder. There is still another reason why it is better to accept and work upon a theory, and that is that it may prove to be a true one.

Whether the theory of erosion which I shall advance to-night will stand the glare of the search-light remains, of course, to be seen. It is one which is not entirely original with me, as it has already been advanced, as I shall show; but yet it is one which I arrived at in an original and independent manner through the accident of personal experience, and so many years ago that I now feel entitled to speak with some confidence about the observations I have made.

I believe erosion of the teeth is due to an excess of uric acid in the blood, and the reasons for coming to this conclusion will be best given by the relation of the following personal experience:

Some years ago my attention was drawn to a peculiar condition on the labial surfaces of my incisors, not noticeable when I looked in the glass, but easily felt with the tongue. It was the minute beginning of that condition we know so well as erosion.

At the same time I was greatly annoyed by an eczematous condition of the skin, which manifested itself upon the hands and feet. The first appearance of this condition was marked by little aggregations of blebs, each bleb not larger than the head of a pin, which prickled and itched, and which, when punctured, exuded a watery fluid.

These blebs extended over little surfaces half as large as a ten-cent-piece, and, coalescing as they burst, ran into each other, making eczematous patches, which, on healing and disappearing after two or three weeks, would be followed by others of the same kind, which ran the same course on some other part of the hands, fingers,

or feet. They became very marked and persistent, particularly between the toes of the right foot, on which, in operating, I stood most.

The explanation given for this was that the condition was partly a neurotic one, and might be expected to manifest itself on the extremities most deficient in nerve-force. The condition of the hands became a source of alarm, as it can be readily seen that it was not agreeable to operate with three or four patches of court-plaster in constant use to hide the condition of the skin.

I put myself under treatment at the hands of a well-known specialist, and at the same time looked up the literature on eczema most carefully. The treatment proved to be beneficial, but did not produce a prompt cure.

Later on, upon my own responsibility, in the hope of better satisfying myself in my own way if this condition was dependent on an acid or an alkaline food-supply, I first tried for weeks the faithful use of alkaline mineral waters, and then for weeks the equally faithful use of acids,—as vinegar and lemon-juice,—but with no very marked result.

Remembering as a boy that good sportsmen kept their dogs from having the mange by withholding meat from them, and believing that this condition of the skin was something like that disease, I abandoned meat entirely, and lived mostly on milk. After a few weeks this eczematous condition gradually disappeared, and to this day has never to any great extent returned.

That this cure was accomplished solely by the abandonment of meat I do not now believe, for I was still under treatment to a certain extent, and I was convinced, as my physician claimed, that the condition was partly neurotic, and that less work, more rest, and more exercise in the open air, accompanied by times of deep breathing to insure a fuller oxygenation of all food-elements, were important factors in producing a cure.

At about the time this eczematous condition was at its worst, I was awakened one morning before daylight with a dull pain in the region of the kidneys. This increased steadily until it became indescribable,—language is weak when used to express its intensity. Morphine was used in large doses, but not promptly enough to save me from the memory of a frightful experience.

At about eleven o'clock relief came instantly, caused by the dropping from one of the ureters into the bladder of a renal calculus, which, when recovered from the urine, was found, of course, to be a nodule of uric-acid crystals.

Here was a new disclosure, and further medical advice elicited the fact that I must consider myself as belonging to those who have the lithæmic diathesis, and that uric acid must be considered my greatest enemy.

A still more careful study on my part of the real cause of the eczematous condition brought out more clearly than I had before known the fact that uric acid was also the most potent factor in its production. Dr. Bulkley tells me there can be no doubt of this.

I was therefore on the verge of gout, other evidence of which was shown by the stiffness of the joints and the pain that was almost constant in them.

Once in possession of this idea of the real cause of my troubles, the means of cure became more clearly comprehended. Since I live in-doors and lead a sedentary life, it consisted in lessening the amount of food taken, and in greater care in its selection; being careful to reject the acid-forming elements, such as sweet wines, champagne, beer, food too rich in starch, and sweets in general,—in fact, all rich foods that overburden the liver and prevent it from fulfilling its function of liberating the waste products which shall be ultimately thrown off in the form of soluble urea.

That excessive meat-eating is productive of impeded liver-action and the formation of an excess of uric acid there can be no doubt.

If one lives in the open air and takes active and constant exercise, the selection of food may not be of so much consequence, and meat can be taken to advantage and without harm; but not so if the life is a sedentary one, and is passed in the warm atmosphere of a close room. In proof of this I can do no better than to quote the following rather startling sentences from a remarkable book called "*The Town-Dweller*," written by that brilliant and lamented English physician, Dr. J. Milner Fothergill. He says, "The town-dweller is more or less dyspeptic. The food which the countryman can digest is beyond his powers. Meat—the flesh of animals—sits easiest on his stomach, and gives him the least discomfort; therefore he prefers it to other food, and, what is more, can easily procure it. It is tasty, too, and gratifies his palate. Why should he not indulge in it?"

"Unfortunately, there is something more about meat than its ready digestibility by a feeble stomach. Its resultant products have to be got rid of, and be cast out of the body. In birds and in reptiles the form of excretion is uric acid. When the mammalia are reached, we find a fluid urine, and the form of excretion the soluble urea. But a little of the early uric-acid formation clings to all

of us. Indeed, the embryo has the uric-acid formation as a matter of fact. . . . The conversion of waste, effete, and nitrogenized bodies into uric acid and urea is one of the functions of the liver. The soluble urea is the more highly oxygenized substance of the two. When a person with a competent liver lives too well, year after year, he gets the gout,—rich man's gout. But when a person comes into the world with a feeble or insufficient liver, the viscus is liable to revert or fall back upon the embryonic formation,—viz., uric acid.

“In such cases it is very common to find gouty phenomena, even with a very spare dietary ; and this is known as ‘ poor-man's gout.’ For long this form of gout, or rather lithiasis, was the opprobrium of the medical profession ; but recent research has revealed its real nature. It is now known to be due to deficiency of action of the liver. The liver is one of the deprives of the hypoblast ; and the town-dweller, in addition to a feeble stomach, has an incompetent liver. The meat which he eats to ease the labors of his stomach overburdens his liver. He avoids the stomach-ache, but in doing so drives his liver downward to the uric-acid formation.

“Lithiasis is his lot, and the urine contains quantities of lithates. This is a serious matter, as the comparatively insoluble uric acid is injurious to kidneys constructed to eliminate the soluble urea. A slow, chronic, interstitial inflammation goes on in the kidney, which spreads bit by bit throughout their structure, and ultimately works their ruin. The condition is best known as “ chronic Bright's disease,” and this form of kidney-change is variously known as the ‘ cirrhotic,’ ‘ granular,’ ‘ gouty,’ or ‘ contracted’ kidney.

“The kidney-change is, however, but one outcome of the morbid process set on foot by lithiasis. The circulating organs are modified in the great vaso-renal change started by constant presence of uric acid in the blood. The heart enlarges, while the arteries harden, and death commonly enough takes place from mischief in the circulation before the kidneys attract attention. The vaso-renal change has usually been on foot some considerable time before the kidney is seriously damaged. But sooner or later—if the patient lives—renal mischief becomes obvious.

“The meat-eating town-dweller is specially liable to chronic Bright's disease in consequence of his overtaxing a naturally insufficient liver. But there is still another factor in the case.

“It has been said before that uric acid is less highly oxygenized than urea. If the embarrassed liver could have the help of unlimited oxygen, it could struggle more successfully with the waste

and excrementitious matters, and burn them up into the soluble urea.

"But, as has been pointed out, the air breathed by the town-dweller is defective in oxygen, and absolutely lacking in ozone. The town-dweller burns the candle at both ends.

"He gives his liver too much to do, and then handicaps it by compelling it to do its work with a defective supply of oxygen. No wonder, then, that his liver reverts to the uric-acid formation of the Saurian in his tropical swamp. The wonder would rather be, if the liver could do its work properly under such unfavorable circumstances. Lithiasis, then, with all its consequential and resultant train of maladies, is the lot of the town-dweller,—of the man who has divorced himself from the soil and the ozonized air which blows over it. Liver-insufficiency with unsuspected kidney-injury is often the reason why individuals go down under the onslaught of disease, as we shall see shortly."

Another great authority, Sir Henry Thompson, in a valuable little book entitled "*Diet in Relation to Age and Activity*," in discussing the question of overfeeding and improper selection of food, says, "I have for some years past been compelled by facts which are constantly coming before me, to accept the conclusion that more mischief in the form of actual disease, of impaired vigor, and of shortened life, accrues to civilized man, so far as I have observed in our own country and throughout Western and Central Europe, from erroneous habits in eating than from the habitual use of alcoholic drink, considerable as I know the evil of that to be."

Further on, in considering food in its relation to the gouty and rheumatic tendency, which of course is the uric-acid tendency, he says, "The accumulated store of aliment—the unspent food, so to speak—which saturates the system is happily often got rid of by those special exercises to which so large a portion of time and energy is devoted by some people. It is to this end that men at home use dumb-bells or heavy clubs, or abroad shoot, hunt, and row, or perform athletic and pedestrian feats, or sweat in Turkish baths, or undergo a drench at some foreign watering-place,—all useful exercises in their way, but pursued to an extent unnecessary for any other purpose than to eliminate superfluous nutrient materials, which are occasioning derangement in the system, for which these modes of elimination are sometimes an efficient cure, and thus are often ordered by the medical adviser.

"But, as we increase in age—when we have spent, say, our first half-century—less energy and activity remain, and less expenditure

can be made; less power to eliminate is possible at fifty than at thirty, still less at sixty and upward. Less nutriment, therefore, must be taken in proportion as age advances, or rather as activity diminishes, or the individual will suffer.

"If he continues to consume the same abundant breakfasts, substantial lunches, and heavy dinners which at the summit of his power he could dispose of almost with impunity, he will in time certainly either accumulate fat or become acquainted with gout or rheumatism, or show signs of unhealthy deposit of some kind in some part of the body, processes which must inevitably empoison, undermine, or shorten his remaining term of life."

Associating the signs of erosion in my incisors with these conditions of excess of uric acid, and noting that as the uric-acid manifestations by proper care and treatment lessened or disappeared the erosion stopped, I felt that I had reason to believe that here at last was a more reasonable explanation of this condition than we had yet had.

At the very first it seemed a reasonable one, for the gouty condition and the period of erosion rarely occur till advanced adult life, and then I remembered that I had often observed that erosion was most common among those patients who were most indolent and best fed. In fact, I had sometimes thought that it was most common among ladies in high society, whose lives were mostly passed in-doors and subject to the temptations of luxurious living.

I have never had the opportunity for the observation of the teeth of many of the working-classes whose lives have been spent mostly in the open air, and who are least likely to be overfed, but in such cases as I have seen I never remember to have noticed a case of pronounced erosion. But, on the other hand, I think with this class accumulations of tartar are rather common. In cases of erosion I feel certain that extensive accumulation of tartar does not occur. It is deposited to some extent, but the acid reaction of the mouth does not favor its accumulation.

For many years, before I had suspected what I now consider the cause of erosion, I thought it to be a condition most common to the luxurious classes. In fact, I think by common consent it has come to be regarded as peculiarly a disease of modern high civilization.

Commencing to make observations among my patients, I came quite frequently upon cases that seemed to confirm the idea I have expressed. All cases of erosion, however, did not give evidence of the existence of established gout; but since I have commenced to make these observations, I never yet remember to have seen a case

where it was not found that there was little care in the selection of food, and where there was not evidence that the life was passed without much thought of those conditions that are necessary to good health.

Besides, it does not follow, by any means, that the presence of an excess of uric acid indicated a condition of gout, although it may be laying the foundations on which the superstructure of that disease will yet be raised; or it may manifest itself in disturbed and deranged conditions which are not recognized or considered as gout at all.

I think in every instance of marked and advanced cases of erosion there was evidence of the existence of gout.

On the other hand, it must be said that one will see positive cases of gout where there are no signs of erosion. Many cases of erosion gave evidence of conditions which had not been suspected to be of a gouty nature, and yet these were unmistakable.

The worst case of erosion I ever saw was in the mouth of a gentleman who nearly every summer is sent to Carlsbad, in the language of his physician, "To keep down the alarming excess of uric acid in his blood."

Another, whose teeth were attacked by most extensive erosion on nearly all their surfaces, was a martyr to gout, and finally died suddenly from complications arising from that disease.

Becoming more convinced of the truth of this idea, I had for several years many conversations with Dr. Darby on the subject, and I was still more convinced by finding that his thoughts had for some time also been tending in this direction. He was so impressed with the truth of this idea that he prepared a paper on the subject, which he read at Albany last May. The paper was illustrated by a series of casts, which gave, in my estimation, unmistakable evidence of the soundness of this theory.

Some of the discussions that were then brought out gave strong support to the theory. It was also made clear that others had for some time inclined to this view; and I learned there that Dr. Kirk, the year before, had expressed the belief that "erosion, strictly so called, of the teeth is, in all probability, a pathognomonic symptom of the gouty or rheumatic diathesis." In the discussion of Dr. Darby's paper, Dr. L. A. Faught said, "When Dr. Perry made the assertion that we should examine for uric acid, he touched upon the line of subject that I was at work upon. We should look to the cause, and when we find this uric acid condition the analysis of the urine would often throw light upon it. I have been engaged in

that study—not directly from the stand-point of erosion, but in relation to the production of uric acid—for some time. There is one thing I have been waiting to hear expressed, and that is that you will find in the majority of cases where you have the condition of erosion what is known as a bilious temperament.”

Dr. K. C. Gibson, in continuing the discussion, said, “I am a victim of gout, and have been for twenty-five years. I have found that not only through an examination of the urine, but also of the blood. The erosion which has taken place on my teeth is a guide to me in treatment.

“Whenever the eroded teeth become sensitive to the nail of my finger, I place myself under treatment.

“My physicians tell me that an examination of the blood has been of more assistance to them in my case than the examination of the urine.”

Other gentlemen also gave testimony of a similar nature.

In support of my theory I could give a list of cases that would exhaust your patience. I will only refer to a few of them.

A well-known New York lawyer came to me after about a year's absence, and I said to him, “You have an excess of uric acid. I am sure of this from the marked erosion of the teeth that has occurred since I saw you.” His reply was, “Yes, my physician is treating me now for an excess of uric acid, and is alarmed at my condition.”

One of the most intelligent women I ever knew came to me several years ago, in despair over the rapid erosion that was going on across the front surfaces of the incisors. I preached this doctrine of uric acid to her, and indicated as well as I could what reform must be made in diet and in the mode of living. Acting on this advice, in a short time the action ceased, and the eroding surfaces lost their polish and their sensitiveness, and her general health improved.

Yesterday she was in my office, and said she was an enthusiastic convert. She further said that her teeth were like a thermometer, and were quick to respond to a few fashionable dinners or to a period of careful dieting, as the case might be. A period of indulgence in indiscriminate food brought back the sensitiveness and made her conscious of her teeth; on the other hand, a return to her rigid diet rendered them less sensitive, and enabled her to forget them.

Another interesting case of long standing adds testimony to the idea I have advanced. Over fifteen years ago I took a gentleman

to Dr. Bronson to consult with him in reference to the advisability of filling certain eroding surfaces on his front teeth. Dr. Bronson, with his usual caution, advised me to wait and watch.

About this time the patient moved to the country, and after this the erosion seemed to be checked. As the years passed by I watched these teeth with great interest, and, as the erosion did not progress, I was taught the important lesson that it is not always well to cut out and fill these places. I did not then understand the cause of the erosion.

Recently I have learned from the gentleman that as long ago as the period I mentioned he had marked symptoms of gout, which he inherited, and that he had been put under treatment to counteract the uric-acid tendency, and that it was kept down only by most rigid care in diet, which he continues to this day. He also had eczematous troubles, which were cured by this anti-gout treatment.

If this case does not add testimony in support of my theory, it is worthy of relation, as it proves that erosion does not always progress, whatever the cause of its progression or of its arrest may be.

But I will not take your time by the relation of more cases.

Now, to recapitulate:

I have stated that I believe uric acid in the blood is the cause of these conditions, but, of course, I have no proof of its presence in the mouth, or of its being absolutely the very acid that causes the trouble; but I feel certain that there is ample proof that that derangement of the liver and kidneys, of which uric acid in the blood is the evidence, is the underlying condition that gives rise to the acid in the mouth, whatever that acid may be. It may not matter, after all, what the acid is, if we are correct in concluding that its origin is to be found in the faulty action of the liver and the kidneys. Once let this point be firmly established, and we will be able to indicate the means of cure.

As we all know, it is an easy matter with the litmus paper to determine the presence of an acid. It is quite a different and more difficult thing to tell what the acid is.

Aside from the observations of cases, it seems to me one of the strongest proofs of the truth of this general proposition is that I have many times been able to arrest this destructive action by correcting the diet and reforming the habits of the patients. This is not easy to do, as it is not often that one will have a patient who may be willing to conform to all the essential conditions.

I have already indicated what these conditions are. I am certain that in my own case much good came from the use of the

lithia waters. Whether the benefit was derived from the minute proportions of lithia contained in them, or to the washing and dissolving action of the water itself, I am not able to say; but I incline to the latter belief, because I have also for years used the Poland water, which is said to be free from lithia, with as good result, as far as I could see, as that derived from the lithia water.

I have also used the Carlsbad and Bedford waters. These two waters give nearly the same analysis, and their action is supposed to be more particularly upon the liver.

If Sir Henry Thompson lays down the general proposition that after adult life is reached we eat too much, I think it may be also safely said we drink too little water. Aside from its washing action on the great organs of the body,—the liver and kidneys,—its influence is felt by the skin, which, in our dry climate and in our furnace-heated houses, becomes dry and hard and incapable of fulfilling its function of helping to eliminate the waste products through the medium of the insensible perspiration.

Another important factor in the prevention of this excess of uric acid is the oxygenation of the food-elements. This, of course, is accomplished by exercise in the open air, or by the adoption of the habit of deep breathing, as advocated in the Checkley System of Physical Culture. This latter is based upon the idea that the lungs are the boilers of the system, and that there cannot be complete physical development and perfect health without the full use of them.

Mr. Checkley says, "This truth lies at the very bottom of natural physical training. To learn to breathe is to learn the A, B, C of physical health. . . . The simplest preparatory exercise is full, long breathing.

"While standing or sitting in any proper attitude with the chest free, take in a long breath until the lungs seem full, taking care at the same time not to harshly strain the lungs or muscles. Hold the breath thus taken for a few seconds, and then allow it to slowly leave the lungs. By consciously breathing in this manner the lungs will be enlarged and strengthened, and the breathing will become slow. . . . The feeling of buoyancy given by this habit is not an illusion by any means. It is genuine."

In a very direct and natural manner, Mr. Checkley has here hit upon a great fundamental truth. The proper oxygenation of the food-elements must lie at the very foundation of good health.

Active exercise necessarily compels deep breathing. The laboring-man, working in the open air, breathes more or less deeply

without knowing it, and retains his health without a thought or care. His food is completely burned up and converted into its equivalent of muscular force.

The rich man, in indolent ease, stuffs himself with tasty food, breathes only with a part of his lungs, gets drowsy, and goes to sleep, only to waken with a liver headache and creaking, snapping joints, and aching body, and with the conviction that life is not worth living. There can be no possible question of the advantage of deep breathing. Some day, like a pill or powder, it will be prescribed by physicians. It is so now, unconsciously, under the head of horseback riding, rowing, boxing, etc.

It need not be taken in this elaborate way. It does not require the paraphernalia of the athletic club-house or the home gymnasium. The habit can be formed, and no man can be so busy, or so rich, or so poor that he cannot, if he only will, frequently, and without the loss of a moment of time, expand his chest and take into his lungs large quantities of oxygen, on which his very life depends. If he has been overfed, it will be his only hope. If he has been underfed, it will help to keep him alive.

It may seem that I am wandering from my subject. If my theory of the cause of erosion is true, it must be seen that I am only indicating a most important factor in its cure.

There remains one other to be mentioned, and that is rest.

If a neurotic condition is sometimes primarily one of the factors in producing the uric-acid tendency, then the importance of rest is clearly seen. An overworked, nervous man, whose occupation keeps him in touch with the innumerable activities of this electrical age, and who develops the uric-acid tendency, followed by erosion of the teeth, may need to be told to rest.

An overfed, indolent woman, with an engorged liver and a consequent uric-acid tendency, must be told to exercise.

In conclusion, let me say, if this theory does not account for all of the facts observed in erosion, I shall join Dr. Darby in submitting it to the profession, with the confident belief that it will account for more of them than any that has yet been put forward.

TACT.¹

BY JAMES SHEPHERD, D.M.D., BOSTON.

ONE of the characteristics of the present generation, and perhaps particularly of the American people, is the careful, intelligent thought that is put into every undertaking, however trivial. Whether it is the purchase of a house or a camera, we try to get the best we can for the money, and are not satisfied unless it comes up to our idea of what it should be. If our watch is to be repaired, we carry it to a skilful workman rather than trust it to a charlatan, who may utterly ruin it. If we wish to know if the water we are drinking is pure, we carry a sample to an expert chemist; if a surgical operation is to be performed, the best skill is none too good. The intelligent person of to-day would no more think of going to a dentist of doubtful reputation than they would trust the examination of their eyes to an unskilled oculist.

We can see that manipulative ability is a quality the possession of which is absolutely necessary to the successful dental practitioner, and any one who does not have it will find the road before him rough indeed.

But the success of the dentist does not lie wholly in his dexterity. Manual skill is not the only quality that has brought success to prominent practitioners. That this is a very important factor none will deny, but if this were all, how account for the small patronage that falls to the lot of some able men?

For a moment let us put ourselves in the place of our patients. There are some who are so conscientious and methodical that their semiannual visits to us are made with the regularity of clock-work. There is little to be done, and as the operation is not painful, they pass their time in thoughtful meditation, indulging in a nap now and then, or joining in a pleasant chat at some opportune moment. There is, however, another and by far larger class, who look upon their visits in another light.

Patients tell us how much mental suffering they have passed through before they could really make up their minds to enter the office to make an appointment, and driven then, perhaps, by the preponderance of physical pain; of sleepless nights passed just before an operation which, in reality, was not particularly painful,

¹ Read before the Harvard Odontological Society, November 30, 1892.

and acknowledge that the greatest suffering was in the anticipation. Do such people desire in their dentist anything besides manipulative ability? Are they satisfied with knowing that the operation has been skilfully performed, regardless of rough treatment at the hands of the operator? They cannot expect to have a painful operation performed painlessly, but they do have a right to expect that the rough places will be made as smooth as possible. To do this something more is necessary than delicacy of touch: we must have an influence over them even before they enter the chair.

But the dispositions we have to deal with are very varied. There is the sensitive patient, with highly-developed nervous organization so prevalent at the present day; the business and professional man, cool and collected in the stock exchange or on the lawyer's stand, but who finds the perspiration start on his forehead when he thinks of an hour's sitting in the doctor's chair; there is the victim of nervous prostration; children, whose minds have been filled with many a tale of woe, and scores of others, too well known to be mentioned.

To lay down a set of iron rules, according to which patients having all these varieties of dispositions should be treated, would be impossible, and it is just here that a very important element in a dentist's make-up is called for, and is perhaps as well described by the word "tact" as any other.

To have the proper amount of sympathy, and yet not so much as to take away the courage; to be able to show the patient that it is better to relax, and not keep themselves at such a high point of tension, that the result will be prostration as soon as the strain is removed, and yet be able to make them brace up at just the right time and bear with fortitude some unusually severe shock; this, I say, requires tact, and is a quality that can scarcely be prized too highly, for with it true success is possible, without it it is beyond our reach.

If we chance to have in our chair a college athlete, who has accustomed himself to all kinds of hardship so that he may cope successfully with the enemy in the field, we do not want to waste any sympathy on him; he would not like it; a half-indifferent air would suit him better; yet we must let him know that we are alive to the fact that he is taking, without a murmur, what most mortals would cower under.

Sympathy is a good thing, and no dentist should be without it, but it must sometimes go masked.

Among the most difficult of patients to get on with are the exceedingly nervous and the professional invalid, who think others must share with them their every ache. If we sympathize with these too strongly it will take from them what little fortitude they have, but if we can distract their attention from themselves and gradually make them see that they really can endure pain, we score a point for both sides. A bit of sarcasm works well at times in getting up a little combativeness, acting as a counter-irritant; in all this, however, we must be very careful to let them see that at heart they have our sympathy. But woe to the dentist who betrays a grain of nervousness or impatience; it will be detected immediately by his patient, and the trials of each are increased fourfold.

As a rule these patients have to be entertained. By this I do not mean that it is necessary or well to be constantly indulging in story-telling, as is the habit of some. To be incessantly talking would, to me at least, be too great a tax, especially as so much of our work requires concentration of thought, but there are natural intermissions when a bit of conversation will be a relief to both parties.

There are some who amuse themselves by working out problems in geometry or by reciting to themselves poetry, but for the average patient to sit two hours in a chair with not a thought from the busy operator before him is tedious.

To be able to "manage" our patients without their knowing it is a great achievement. Many desire the worst cavities attended to first. On general principles this may be the wisest course to pursue, but not always. Some, if we should begin with the most sensitive operation, will be discouraged at the start, while if we take a more simple one we gradually allay their nervous dread, so that they quietly endure that which if attempted at first would have been borne with difficulty. Of course there are cases demanding immediate attention, and we must do the best we can, but sometimes here a temporary stopping is required.

While this is a good general rule for regular patients, it applies with greater force to new ones. One of the very first things we want to do is to get the confidence of our patrons.

If, instead of starting at once on a cavity that is difficult of access, exceedingly painful perhaps at the same time, and putting in a filling that cannot be appreciated by them (although we may have put into it all the skill we have at command), we take one that we can finish quickly, easily, and the good points be

readily seen by even an unskilled eye, we have their respect, which once gained will carry them and us over the more difficult places.

There is another point where a patient's wishes are to be set aside by our better judgment, and that is in the amount they can endure at one sitting. Some think that after they once have their courage up they would prefer to spend the whole day in the chair, if there is much to be done, rather than spread it over a number of sittings. This may work well in some isolated cases, but generally it is not wise. I have in mind the case of a gentleman who went to a dentist every day for a week, spending the whole of each day in the chair. After the first two or three days, his nerves were so affected that he not only had the strain during the day, but all night long he had it in his dreams. The result was that for fifteen years he carried the dread of that week, and had nothing done to his teeth. Now, by taking his medicine in smaller doses, he does not mind it, and comes for an examination every six months or a year.

We should lay it down as an iron rule that nothing short of the best work will satisfy us, and if we are satisfied surely our patients will be. There are instances, however, when the best work for the case in hand is not the most thorough.

Frequently we have some invalid or very nervous patient who cannot endure the strain of a long operation, and in such a case we are justified in temporizing, or doing work that under ordinary circumstances we would not consider up to the standard. It is far preferable to put in a filling that will preserve the tooth, although from our æsthetic stand-point it may not be what we would prefer, rather than entirely discourage them by a tedious operation so that utter neglect of the teeth in the future will be the result.

We should answer as intelligently as possible all questions that may be asked. It is pleasant to think that our patients are interested in the work. At all times we should tell them the truth, and nothing but the truth, but occasionally it is better for them not to know the *whole* truth,—*e.g.*, when I apply a preparation of arsenious acid to destroy a pulp I do not say that I am using arsenic, for the very idea of having a deadly poison in their mouth might be anything but pleasant to some. I am particular, however, to tell them that what I am using is powerful, and they must be careful not to remove it. Just so in the use of other poisons, we can satisfy their curiosity without causing anxiety by giving them the whole truth.

Perhaps there is greater opportunity to show tact in handling children than in any other class of patients. In the first place, begin with the parents if possible. Tell the mother never to mention in the presence of her children that she has had a hard time at the dentist's. The little minds are sure to catch it up and treasure it, and they easily form the idea that it is a dreadful thing to have their teeth attended to, when, nine cases out of ten, if they come with an unprejudiced mind, they do not find it bad at all.

Generally I like to have the child alone, breaking over the rule perhaps the first time, when a simple cavity is taken or the teeth cleansed. If honesty is to be practised with adults, it surely should be with children. Never deceive. Some seem to think they accomplish much if they tell the child they intend to only look at a tooth, and then, without warning, put the forceps on and extract it. They may have succeeded well in this one case, but they never get the confidence of that child again. Once secure the confidence of the child, and the way before you is comparatively smooth. Better to keep your patience for one or two sittings and win the child over to your side, than lose it at the start and have a struggle with him ever after.

The deciduous teeth are usually not very sensitive. Of course the sensation produced by the instrument is not pleasant, but if we use a little tact we can make them almost enjoy it. The little mind that can make a baby out of a rag, or a horse out of a stick, can easily be led to think that it is great fun to have the teeth cared for.

As a rule the hand instruments are preferred to the engine, but with a little tact the latter can be used. Often the most disagreeable part of this is the noise, and of course it is impossible to keep them from noticing it, but if we tell them that it makes a great noise that is very funny, we can often make them laugh over what if presented in another way might call forth a tear. Sometimes, of course, a cavity will be sensitive, but even here we can help them: appeal to their bravery, and tell them it is a good chance to show their courage, and they respond nobly.

Let us remember that we have accomplished but half our mission when we can skilfully perform an operation, the other half is to be able to manage our patients, and that can only be done by tact.

FILLING ROOTS WITH GUTTA-PERCHA DISSOLVED IN CHLOROFORM.¹

BY DR. R. I. BLAKEMAN, NEW YORK.

It has been suggested by a member of your Executive Committee that it might be of interest and possible assistance to some of the younger members of the profession to hear some testimony on the subject of filling roots with gutta-percha dissolved in chloroform. This solution, depending on the degree of fluidity, is very permeative. Perhaps some of you may have experienced getting it on your fingers; if so, you have doubtless noticed how it penetrates the fissures of the skin, and how difficult it is to remove at the time without the aid of a solvent. If an instrument be dipped into it, especially one that is a little rough, the gutta-percha adheres to it very closely, and remains so after the chloroform has evaporated. It sticks to the smooth surface of glass as well, and also to tooth-structure. And I might state here, though it does not directly bear on the subject, that it sometimes answers nicely to line gold with against which amalgam is to be placed, so that the gold may not be affected by the mercury. When the fluid is very thin, it seems as susceptible to capillary attraction as water. Therefore, as some of the canals we wish to fill are very fine, and we feel that they must be filled, as upon this largely depends the future welfare of the tooth, to fill them with this solution seems practical so far as the principles of physics are concerned. For the purpose of describing the process of manipulation, let us consider a molar, the roots of which must be filled from a posterior cavity difficult of access, a somewhat common occurrence. When the roots are dry and ready to fill, it is best to add some fresh chloroform to the solution kept on hand, so that the upper portion is quite thin, while the lower is left very thick. Then with a small broach, with a few fibres of cotton wrapped about the end, the solution can be carried to the canals, and, when the entrance to them is flooded over, it can be pumped in with a small bare broach.

After the canals are full of the thin solution, by dipping deeper into the supply the thicker gutta-percha is obtained, which can be pumped into the canals in like manner, the chloroform being worked out so that it can be evaporated with the chip-blower. If there should be a doubt as to the fluid having gone to the apex of any canal,

¹ Read before the New York Odontological Society, January 17, 1893.

it can be pushed farther by making a piston of warm gutta-percha. But great care should be taken in doing this, and the patient should be instructed to respond to the first sensation, for sufficient force may be brought to bear unconsciously to push the fluid through the foramen. When the canals are sufficiently large to permit of it, it is best to put in a gutta-percha point after they are full of the solution, but not so tight as to cause pressure at the end of the root. It might be well to emphasize this point, as any one not accustomed to filling roots in this way is very liable to force something through the apical foramen, which we all know the importance of avoiding in roots that have never had fistulous openings. My personal experience in following out this method is that I am more apt to do too much than not enough, and, after experiencing the results of going too far in some cases, find it easier to stop in time. It will be admitted, I think, that many valuable methods in practice are of additional value because they allow the operator, in case of any trouble, to easily undo his work, and it is on that basis that I claim this method of filling roots to be more advantageous than many others. I experienced the value of this method not very long ago in the following manner. A lower wisdom-tooth, buccal cavity, the root-canals of which were very fine, had been filled as above described. For reasons that have no bearing on the subject, it was decided that the filling should be removed from the roots. This was successfully accomplished by using mechanical means to remove all the gutta-percha accessible; then with a drop-syringe the pulp-chamber was filled with chloroform in order to dissolve the gutta-percha remaining in the roots. This was hastened by stirring it up with a broach. It was necessary to repeat this process only two or three times. I have brought with me for exhibition a bicuspid root which was filled in the mouth, and, owing to its being split, it gives us a chance to see how successful the operation was. The gold wire, twisted about the neck, was put there at the time of filling, for the purpose of holding the two pieces together, as the root was already split at that time.

Reports of Society Meetings.

AMERICAN DENTAL ASSOCIATION.

(Continued from page 207.)

Third Day.—Evening Session.

MEETING called to order by the President, Dr. Walker.

The minutes of the morning session were read by the Assistant Secretary, the Secretary being absent on account of illness.

Section VI., Physiology and Etiology, announced the election of the following officers: H. A. Smith, Chairman, and L. E. Custer, Secretary.

Dr. Smith, chairman of Section VI., then reported as follows:

"At the last annual meeting your attention was called to the work undertaken by this Section in the examination of prehistoric crania. Satisfactory progress has been made in this investigation during the past year. Dr. J. J. Patrick will make a report of what has been accomplished, and also describe briefly the methods adopted in his investigation, and suggest a plan for the publication and preservation of the data obtained. As the work has proceeded the members of the Section have become more and more convinced of the great scientific value of this investigation, not only to ourselves, but to those who come after us; and in ordering these investigations the Association has shown the world that it is animated by the true scientific spirit.

"A paper has been submitted by Dr. Patterson, entitled 'The Effect upon the Tissues of the Oral Cavity produced by the Internal Administration of Certain Drugs,' and we recommend that it be read.

"I would report, as to the funds voted to the Section for the investigation just referred to, the following:

"Balance on hand August 4, 1891	\$13.25
Amount appropriated August 4, 1891	500.00
Amount received by curator during the past year	55.00
Total	\$568.25
Amount expended by curator since August 4, 1891	225.05
Leaving a balance of	\$343.20

to be used for this work. Dr. Patrick has furnished the items of expenditure, and they have been audited by the proper officers of the Section."

Report received.

Dr. J. D. Patterson then read his paper on "The Effect upon the Tissues of the Oral Cavity produced by the Internal Administration of Certain Drugs," as follows:

The importance of this subject can scarcely be questioned by the observant dental practitioner, for he is almost daily brought into contact with certain diseased mouth conditions which are popularly believed to be the result of medication for certain constitutional or systemic conditions. This belief has been so long established, has been so fostered and taught by the physician as well as the dental practitioner, that it would be surprising if errors had not crept into or become coupled with the science of the question.

While listening to the history of cases as given by intelligent patients whose dental arches and surroundings have succumbed to disease, we find in very many cases that the inception of the trouble is firmly fixed in the patient's mind, and is believed to have been the result of certain medicines given for systemic effect, which have destroyed both the teeth and the gums and process which surrounded them. Such remarks as the following are very familiar: "My teeth were perfect until my physician gave me medicine during sickness, which salivated me," or, "I have taken so much iron that it has decayed my teeth." There are many other drugs which are thought to prejudice the integrity of the oral tissues, but the mercurial and iron preparations receive the burden of blame. The former, because the effect comes to the oral tissues alone through its internal administration, and because the belief in its ravages is so general, will receive attention in this essay to the exclusion of other drugs.

"The form in which mercury is given for the constitutional effect is commonly that of chlorides or iodides. A small dose, say one-tenth to one-twentieth of a grain of bichloride, is given every three or four hours until the desired effect is produced. The physiological action of mercury is tonic, purgative, alterative, antiphlogistic, and sorbefacient. The metal itself is inert, but by combination with the acids and fluids of the body becomes active, and is easily absorbed, passing into the blood from the stomach, the lungs, mucous membranes, or skin, in each case probably as an oxyalbuminate of mercury. In the blood its effects are tonic in small doses, but in quantity it produces impoverishment, diminishes

the red blood-corpuscles, and disorders nutrition. It stimulates the glands of the body, especially the salivary, to the production of pathological secretions. In small doses, administered for a short time, the mercurial preparations are blood-tonics, increasing the number of red corpuscles and its general condition. Soon, however, they provoke waste by stimulating the lymphatics, and, if the small doses are continued, symptoms of so-called mercurial poisoning manifest themselves, and 'hydrargyrisms,' commonly called 'salivation,' is exhibited. The symptoms of salivation or hydrargyrisms are said to be a fetid breath, swollen and spongy gums, a blue line along the gum-margins, stomatitis, sore and loosened teeth, a metallic taste in the mouth. In extreme cases ulceration and sloughing occur around the teeth, and the jaw-bone is sometimes laid bare."

The foregoing is in brief a description of the effect upon the oral cavity of the giving of mercury for constitutional effect, as gleaned from medical and dental text-books, and especially from Potter's "Materia Medica and Therapeutics."

My purpose is to study briefly the situation, and to detail some practical experiments testing the truth of some of the usually accepted statements.

Some years ago, having been closely allied with physicians in the care of stomatitis resulting from mercurial poisoning, I began to doubt that the classic symptoms of ptyalism as found in the mouth were *per se* the result of mercury. My attention was first called to "*the blue line*," and text-books signally failed to enlighten me as to why it should be present. Inquiry among all classes of medical practitioners developed a wide difference of opinion about the *blue line*, that invariable symptom of salivation. They declared that it was there, that it was always present in salivation, and that was sufficient for them.

Now, in the earlier years of my practice, before I knew anything about mercurial poisoning, I had seen many "blue lines" around gum-margins as the result of a deposit of calcic matter, which disappeared under dextrous use of a scaler; and I asserted that the blue line was caused by calculus, and was not the result of mercury *per se*. I asked physicians to explain physiologically the presence of this blue line, and the only explanation was from an ignorant practitioner, who asserted that it was caused by the presence of finely divided metallic mercury gathered there from terminal vessels,—a thing utterly impossible, as mercury internally administered cannot reach the gum-tissue in any such form.

I then agreed to entirely obliterate in a single operation such blue lines in any patient brought to me, the patients to be chosen from those who were salivated by prolonged administration of mercurials. In this I was successful.

Finding that the "blue line" was a result of local conditions only, I then began to experiment upon the "inflamed and spongy gums" in salivated cases. I solicited cases of this kind, and stipulated to cure them without withdrawing the mercurial doses, if the physicians desired still to continue the mercury-giving. The result was perfectly successful. Under careful removal of all irritant matter, and the institution of perfect hygienic and antiseptic conditions, all swelling and ulceration, save that which was clearly syphilitic, in a few days would disappear; this too, as has been stated, without withdrawal or lessening of the dose of mercury. These experiments, which were carried on for about two years, were made possible from the fact that there were accessible a large number of patients suffering from the specific syphilitic taint under care of specialists.

The conclusions then reached, and which have since been verified, were that "the blue line," "the inflamed and spongy gums," and other of the more serious appearances were the result largely of local irritation, and not of the mercury; that, with proper care, these symptoms, which have been and are characterized as symptomatic of mercurial poisoning, may be entirely prevented.

In the condition of salivation we find the oral cavity unusually predisposed to the gathering of local irritant matter. There is an enormous, unusual secretion of vitiated saliva, and the precipitation of calcic matter is much increased. All the buccal secretions are unhealthy, and the condition demands more thorough hygienic care, and usually in such cases receives less; therefore the oral tissues fall a prey, not to the mercury, but to the intensely morbid local condition which the salivated condition has rendered possible. It is a condition similar in some particulars to that of the oral cavity in the case of pregnant women. The teeth fall a prey to decay in an unusual manner, not because they are softer at that time, but because "they then need more care and receive less." The fermentative processes are much more active, and the care is in inverse ratio to the needs.

Every observant practitioner must have noticed how closely the condition met with in irritation from calcic matter where there is no mercurial suspicion resembles the condition described in salivation. There is the blue line, the inflamed and spongy gums,

sometimes covering the teeth, and ulceration of the gum-margins. The impoverished condition of the blood and the profuseness and character of all oral secretions constitute the chief difference. The unusual and malignant results sometimes occurring in salivation, and which do not appear in calcic irritation, may be safely laid to the unusual predisposition or the syphilitic condition which usually precedes the giving of mercurials. Indeed, Dr. Ringer, in his "Hand-Book of Therapeutics," says that the phenomena ascribed to mercurials are similar to those which will result from syphilis; and may it not, then, be true that the extraordinary symptoms referred to may be entirely due to the specific poison for which the mercury is given?

The whole question is one of interest and practical value to both dentist and physician. So long as the mercurials hold such an undisputed and merited position in therapeutics, it is of first importance to ascertain, if possible, just what are the evil results following their use.

It has been the purpose of this paper to show that some of the classic signs of mercurial poisoning which appear in the mouth are not symptomatic, but largely local; that the "blue line" is solely and only caused by calcic depositions; that the inflamed and spongy gums are resultant from the same cause, and from other irritant matter, such as fermenting particles of food-matter and mucus, and can be successfully prevented or cured by unusual attention to the removal of irritant matter and the establishment of thorough antiseptic conditions.

It would surely be a boon to diseased humanity if it were known that certain strict treatment of the mouth would prevent destruction of its tissues, when, on account of specific poison, it is desirable to continue potent doses of that prince of germ-killers, mercury. We believe this can be accomplished, and that much of the supposed ravages of mercury upon the tissues of the mouth may be safely ascribed to pure carelessness, ignorance, and neglect.

DISCUSSION.

Dr. W. W. Coon.—I seriously question the statement that the blue line is always caused by the deposition of tartar around the necks of teeth. I took the impression of an edentulous jaw, in which there were several bluish deposits of pigmented matter. In several cases suffering from pyorrhœa, which had been under treatment for a long time, the necks of the teeth were entirely free from

deposit; but if an instrument were passed in, and the gum held away from the root, the blue line would show.

Dr. Fillebrown.—I am quite in sympathy with the view Dr. Patterson takes of these cases which are often called pytalism, but which I think depend upon other circumstances, we seldom seeing a case of real salivation. Many of the blue lines are caused by irritating substances under the edge of the gum. Lead is supposed to produce a blue line, but that does not always happen. I had a patient, a lady in perfect health, whose teeth and gums were in good condition, and the blue line was very marked around each tooth. That was twenty years ago, and the gums and teeth are still healthy. I find, as was said about germicides this morning, that there are many circumstances which control the phenomena in the human system. We cannot always tell what they are. I do not think any single disease or trouble causes it.

Dr. Morgan.—Had your patient ever used charcoal as a dentifrice?

Dr. Fillebrown.—I think not. I know the dentifrice she used.

Dr. Kirk.—I do not propose to dwell on the subject, but I should like to hear a description of the condition that was produced by the mercurial salivation. It is a rare occurrence. I know of a case where there was a distinct blue line around the gum-margin, more pronounced in front than at the posterior teeth. It was a case of pigmentation from charcoal, fine particles of it being embedded in the tissues themselves. It is like the case that Dr. Coon reported. In some of the teeth I could take an instrument and move the gum-tissues away from the tooth. The particles of charcoal were embedded there. The line was uniform and continuous, and the history of the case demonstrated that this patient had used charcoal as a dentifrice exclusively all her life. It gave a remarkable bluish cast to the gums.

Dr. Smith.—Reference has been made to the blue line which we occasionally observe about the necks of teeth, where there is no disease. In the few mouths of the African race that I have examined, I have found it amounting to a peculiarity that a blue line is present about their teeth. I have had in my practice one patient who had the blue line, and it was always suggested to me that she was not of the pure Anglo-Saxon race. If others have noticed it I would like to know. There was something besides this that impressed me that the woman, although she passed for white, was not so. I would like to ask Dr. Morgan if this is a characteristic of the African race?

Dr. Morgan.—It is one of their characteristics, and in the mixed races it very frequently happens. They are called blue-gum negroes, and there is a legend that the bite of a blue gum negro is death.

Dr. Smith.—Does this extend all around the teeth, or is it only anterior?

Dr. Morgan.—It is in lines; sometimes it is near the very margin of the gum; sometimes in patches around the teeth.

Dr. Smith.—In this case they were on the margin of the gum, and not continuous, but the pigmentation was more in patches.

Dr. Hunt, of Indianapolis.—While Dr. Patterson was reading his paper, the idea occurred to me that possibly in the majority of cases this blue line that we all talk about, but nobody gives a reason for, is usually due to congestion. That may have been in the minds of all who have spoken, but no one has said so. If it is due to congestion, as Dr. Patterson has said, it will undoubtedly be present whenever a low grade of irritation exists, whether it is caused by calculus or any other irritant, and is not produced particularly by the mercury, but possibly it is due to the greater deposition of salivary deposits because of the increased amount of saliva which is poured out while the medicine is being taken. I have never heard the cause explained. I should like to know what it is. Dr. Smith speaks of it as a pigment. If it is only a pigmentary deposit, it is something new to me.

Dr. Gramm.—I had a case of a patient in most excellent health who has had for a number of years the blue line, the typical blue line of mercurial poisoning. The writer stated that ulceration of the gums is due mainly and largely to neglect of the teeth or of the mouth under those conditions. The fact is, we have those very same conditions when there is no syphilitic taint present. When mercurials were used in days gone by they were not given for syphilitic conditions, but as a purgative when there was no trace of syphilitic poison. The writer compared also the degeneration of gum-tissue of the alveolus through mercurial action to the destruction of tooth-tissue during pregnancy. These cases to me seem not at all parallel, since the causes underlying the degeneration of tissue in one instance and the degeneration of tooth structure in the other are altogether different.

Dr. Horton.—I want to add a word to what has been said. From my observation I am satisfied that in nineteen out of every twenty, if not forty-nine out of every fifty cases, the local irritation and the appearance of the blue line can be traced to calculus de-

posit, more extensive in some than in others. In the case mentioned by Dr. Fillebrown, I am satisfied that a careful examination of that would reveal that the blue line was caused by minute particles of salivary deposit. I have seen very many cases affected that way. While it has been regarded among the medical authorities as a sure sign of the presence of mercurial irritation, I am satisfied that it was simply the increased amount of saliva, and the concentration of an inflamed condition there by the local irritation and by stopping the secretions and throwing them upon that part of the gum-tissue.

Dr. Fillebrown.—If Dr. Horton should have a patient eighteen or twenty years old, with perfectly healthy teeth and no other sign of anything present except a little blue line, he would not charge that to calculus, would he?

Dr. Horton.—It may be a deposit around the teeth. I have seen it in children very frequently.

Dr. Fillebrown.—That patient has been under my care for a long time, and Rigg's disease or calculus has never been exhibited.

Dr. Kirk.—I have been examining mouths more or less for fifteen years, and I have never seen a case of mercurial pyalism. I would like the condition explained. I have asked Dr. Jack, and he has never seen a case either. I would like Dr. Horton to describe one of his many cases.

Dr. Cravens.—In some cases we have discoloration of the gum. It may not be blue, but it is certainly discolored, where the patients are in the habit of using soap for their teeth; the teeth will become coated with a film on account of the soap being used. The gentleman lost sight of the fact in talking of salivary calculus that the gum may be pushed away and still there will be the line. If salivary calculus will make a blue line, it would make it in the gum, and the gum would waste, because calculus may be deposited in any tissue. It might be in the gum-tissue.

Dr. Barrett.—I have seen a blue line along the gums at times, which was simply a surface deposit and was comparatively easily removed. The pigmentation or the coloring of it did not seem to penetrate to any particular depth. You could not wash it off, but it could be rubbed off. I never know to what to attribute it; I cannot conceive that mercurialism should cause a line along the gums. I have seen it cause a purple color in cases in which I have every reason to suppose it was mercurialization, not pyalism. I did not suppose mercurialization would cause a blue line, but it will cause a pigmentation, not unlike that which you observe in necrosis of the bone.

Dr. Patterson.—My friend Dr. Gramm misapprehended the statement I made in regard to the condition known as salivation being analagous to the one in pregnancy. I merely compared the two, that in both cases the mouth needed more care and received less. I do not deny that there may be ulceration from hydrargyrisim. There may be a low grade of irritation on account of the impoverished condition of the blood. The gums are pale; they are not blue, nor purple, but pale on account of the changed condition of the blood, and because the blood is so impoverished ulceration may be found in different parts of the body, but the inflamed and spongy gums that we find in cases that are called cases of salivation in a large degree are the result of local irritation. In the condition of ptyalism or mercurial poisoning the hydrargyrisim is merely a condition of enormous secretion of all the fluids of the mouth, and of every part of the body, as far as that is concerned. The blood is impoverished, but as to the symptoms described by medical men and dental men in their text-books, I do not think they are at all indicative of the trouble. I have proved it many times. It is very difficult to find cases, but I was especially fortunate on account of being able to take advantage of many within two years which came from the hands of a specialist; he furnished them all to me.

Dr. Morgan.—I was reared in a country where mercurials and especially calomel were given very freely; and while I have not seen many cases since I have been a professional man, I have occasionally met some. I have seen it in all its stages. Not long since I was called to see a person who had a portion of the superior maxilla necrosed, which was the result of ptyalism. There was ulceration on the surface of the second superior molar, and the tooth was loose, and it took the crown of one of the permanent teeth with it.

Dr. Patterson.—How did you distinguish whether it was the mercury or the disease for which the mercury was given?

Dr. Morgan.—The physician told me.

Dr. Patterson.—How did he distinguish?

Dr. Morgan.—I don't know; I removed that portion of the maxilla. I had a case where I took out an inch and a half of the inferior maxilla, including one of the temporary teeth and the germs of two permanent teeth, which was the result of mercurialization. The boy had been taken sick, and had been given mercury very freely, and it was a severe case of salivation, as they called it, and that was the result. I have seen a great deal of ulceration in such cases. I have a patient living whose jaws cannot be opened.

We once gave, in the South, under the teachings of Cook, of

the old Pennsylvania College, very large portions of mercury. I had a friend die recently to whom was administered within six or eight hours three hundred and sixty grains of calomel. They began with sixty grains; after a consultation they increased the amount to one hundred grains, and gave him three more doses. They administered it in that style all over that part of the country. I had an uncle die from an immense slough from the teeth.

As to the symptoms, the first is an unusual flow of saliva; then there is tenderness of the peridental membrane and soreness of the teeth until they become exceedingly tender; then there is a tenderness of the gum, and they lose to a considerable degree their density and their strength, and are easily wounded. I had a case not long ago from my homœopathic friends in the city of Nashville, and when I appealed to the lady, in one case, and told her she had been salivated, she said her doctor had as much right to give ten grains of calomel as any one else, and he did so, and her mouth got sore. In the other case it was denied; but there is a peculiar odor that you can at once detect. Of the consequences that follow and the changes that occur in the gums I am not familiar; because in these cases I have removed necrosed bone when it was necessary, and then referred them to the family physician for treatment. In nearly all these cases a loss of substance occurs, an absorption of the margin of the gums, and rapid absorption of the alveolar process. I had a friend die recently who was salivated many years ago, and rapid absorption occurred until all his teeth were much loosened and ready to drop out. He recognized that as a consequence of the salivation. There is a stage when you have that purplish appearance to which Dr. Barrett alludes, a simple chronic inflammation in which there is stagnation of the blood, where the blood is deteriorated, and you have the purplish line in the gum-tissue proper, not extending down on the maxilla beyond the gum-tissue. In that condition they are often exceedingly sensitive, and bleed very readily.

Subject passed.

Dr. Patrick then read a paper giving the result of his investigations relative to prehistoric crania, which had been ordered by the Association. After giving a number of statistics, he said,—

“When this work is finally completed, it will be an index to all the established museums in the country, containing crania that have been examined. There are, of course, many difficulties in an undertaking of this kind. Some of the crania in the Cambridge Museum were very ancient; they were gathered up out of confused

heaps that vandals had produced by opening graves and stealing the silver and gold ornaments and pottery that had been buried with the mummies, throwing the ground and the skeletons and the crania all together. Huxley gathered these up, and as he gathered them he put his own number on, so in that condition they came in the possession of the Peabody Museum at Cambridge. When a private collection comes into the possession of such an institution, they leave the old numbers on of the original collector; then they put their own museum or catalogue number on; so in this work, where that occurs, the crania are in groups. Sometimes there are fifty under one number, carrying the original record number of the owner. I will also put that in the books which I am preparing, so if any question should arise in the future it can be verified immediately by referring to this appendix to our transactions, giving the number; all you need to do is to write to the curator. You can see on the diagram at once which side of the jaw it is; when this is complete it will be of great assistance, I am sure."

DISCUSSION.

Dr. Peirce.—There is nothing to discuss in the paper, except to emphasize the fact of the labor that has been done in the matter. I know some of the work, because some of it was under my supervision. I employed two young men, who were experts in that line, and after spending three afternoons with them, they pursued the work alone, and it took them nearly a month to go over twelve hundred skulls and give the different conditions, as noted in the table this afternoon. With regard to the measurements, I consider them of little use, although they have been taken with great accuracy; because the teeth vary so much that it is impossible to give figures that we can stand by. You cannot imagine the amount of work Dr. Patrick has had to do in order to give us this little summary. The value of this, when it is finished, will be very great, because it will give us a very definite idea of the condition of ancient skulls, and enable us to compare them with those more modern.

Dr. Smith.—I think when this work is complete that we are very likely to have some of our views disturbed in reference to the frequency of caries at the present time as compared with the ancients. Although many of them have not yet been tabulated, you will notice that all the lesions that are present in our race to-day were present in a goodly number in those prehistoric crania; and it would seem that if we are to draw any deductions from the report made, that caries was almost as prevalent at that day as it is now,

and that caries of the teeth is not a result of civilization. I say we will probably have our views disturbed in that direction, and if we establish that fact, it will be of great value to us. Take the number of teeth tabulated; look at the large number of teeth lost from disease, because they were painful, showing that the lesions which cause the loss of the teeth to-day were present then. If we can only establish those facts it will be of incalculable value.

Dr. Patrick has very little faith that we can establish any very valuable facts from measurements. I was fearful that he would not make those measurements on account of his opinion, and it is very gratifying to find that he has done so, so that persons who hold this idea can prove it or disprove it. This work is so thoroughly done that for thousands of years it will not have to be repeated, and if any one doubts the conclusions that have been arrived at, he has the means at his disposal of going over the work and seeing for himself. It will be a monument not only to Dr. Patrick, but to the American Dental Association, even if it should be the only thing they have accomplished during their existence.

Dr. Ottofy.—I was very much pleased with the report as far as it has gone, and I am quite well satisfied from the statistics which have been read that when it covers the field which it eventually will, it will be the grandest thing the Association has ever undertaken. It is very interesting to notice the different conditions that have existed in prehistoric times. It is a great advantage in examining a cranium, because much that is covered by the gum-tissue can be seen at a glance, and I am in favor of continuing the work which Dr. Patrick is doing.

Subject passed.

Dr. Kirk.—I should like to report on the work of the newly-created Committee on State and Local Organization. It held a meeting to-day, and, pursuant to their instructions, I formulated a series of questions to cover as nearly as possible the field of dentistry that is covered by the sections of this body. I shall present them for the judgment of this society, so they may go out with the authority of the Association. It is the object of the committee to send out this series of questions to the different local organizations through the country, have them made part of the regular order of business, secure a report of the discussions from all the local societies, and have them referred to the proper sections of the American Dental Association; then the reports so received can be digested, and an abstract or an epitome of the results so obtained furnished to this body for discussion and for publication in their

annual reports. The object is to get the consensus of the whole profession on certain topics of interest, and be able finally to formulate some definite principles of practice. We have formulated a series of ten questions, which are as follows. We have endeavored to cover the field as widely as possible.

1. Should examining boards have power to grant certificates of qualification to undergraduates?

2. Should immediate root-filling be practised while purulent conditions exist at the apex?

3. What are the best materials to enter into the composition of temporary fillings, to be retained for a minimum of three years?

4. What are the best methods for obtunding sensibility of the dentine by either local or general means? Should arsenic ever be used?

5. What are the best forms of partial lower dentures, and the methods for constructing the same?

6. Corrective dentistry; its present status. What are the simplest and most universally applicable forms of apparatus, and the most efficient retaining fixtures?

7. To what extent and under what conditions is the collar crown the cause of pericemental inflammation?

8. In cases of congested pulp, should arsenical application be made without preliminary treatment?

9. What are the advantages and disadvantages of the use of the matrix,—*a*, with gold; and *b*, with plastics?

10. The etiology of the pus formation?

If these questions meet with the approval of this body, I should be glad to have the same announced, and I make a motion that the circular, as read, shall be sent out by the committee with the authority of the Association. This is only for the coming year, of course. Different questions will be sent out annually.

Report received and motion carried.

Adjourned.

(To be continued.)

NEW YORK ODONTOLOGICAL SOCIETY.

A REGULAR meeting of the New York Odontological Society was held on Tuesday evening, January 17, 1893, at the New York Academy of Medicine, No. 17 West Forty-third Street, New York City, with the Vice-President, Dr. Brockway, in the chair.

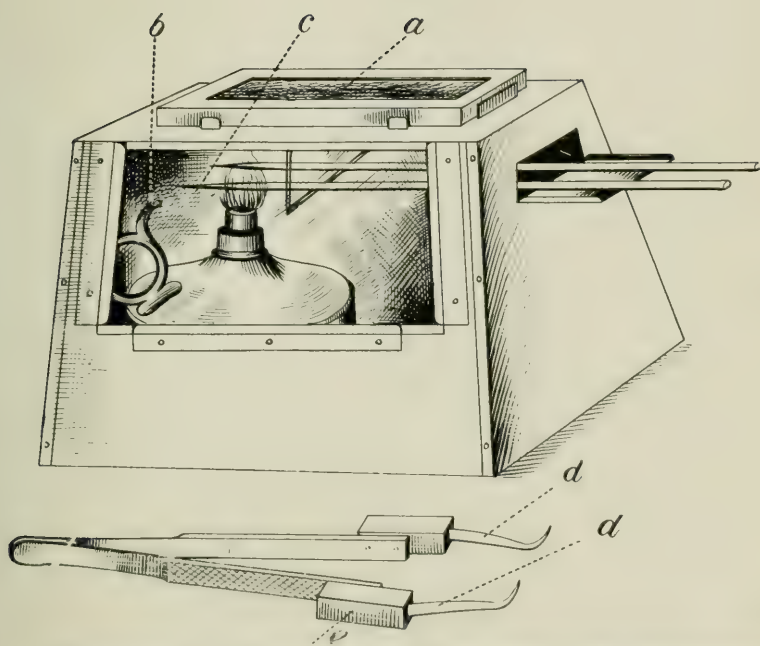
The minutes of the previous meeting were read and approved.

INCIDENTS OF PRACTICE AND CASUAL COMMUNICATIONS.

Dr. George Allan.—For some time I have thought that this part of our proceedings ought to receive a great deal more attention than it has in the past. So I decided this evening to bring before the Society two or three little things that I have found useful in my practice, and let you judge them for what they are worth, and decide whether they are good or not. The first thing is a celluloid sheet; I have used it instead of a towel or oil-cloth for the top of my table and my bracket. It is absolutely clean, is wiped off without the slightest difficulty, and it seems to meet all the requirements for a covering of that kind. The greatest objection to it is that if you happen to let a match fall upon it, it will burn very rapidly. It will warp a little if the sun shines upon it, but practically it has no serious objection, and I would not be without it. It is cheap and economical, and a sheet will last two or three years. If you let sulphate of iron or iodine fall upon it, it will, of course, stain; but for neatness and cleanliness I know of nothing that is its equal. I have a sheet of it here. I think enough to cover a bracket would cost about sixty or seventy cents. It comes by the yard or by the sheet, in all sizes, shapes, and colors. You can get it at the Celluloid Company in Newark; they have an office in New York, somewhere on Broadway.

The next little appliance is a pair of pincers for soldering. You take the ordinary pincers and hold a piece of gold over a Bunsen burner, and, unless you are very quick, your fingers will get very hot and you must drop it. I had a pair of pincers made with each of the points set in a little box of asbestos. I find it very valuable and satisfactory. You can leave it in the burner as long as you please, and the heat will not affect it; it is a good thing both in the office and in the laboratory.

Some years ago, when I was in Boston in Dr. Shepard's office, I found he heated his gutta-percha by placing one end of a piece of soapstone in or close to a Bunsen burner. In use he placed the gutta-percha on the cooler end of the stone, and then passed it down to the heated end, and in this way controlled the heat perfectly. The arrangement was very effective, but had some objections. I got up a little oven which meets every want of the dentist for warming gutta-percha. When in use, you light the spirit-lamp and place it under the end of the stone; at the same time the instruments to be used are passed through the opening at the end of the oven, over the wire loop inside to the flame of the lamp, so that



a, soapstone slab; *b*, removable mica front; *c*, instruments for packing gutta-percha or (?) stopping; *d d*, points; *c*, box packed with asbestos: points *d d* are packed.

the instruments to be used and the gutta-percha will be warming at the same time. The slab, you will notice, is hollowed out, so that the small pieces of gutta-percha will not roll off. The stone heats gradually, and the amount of heat required can be regulated to a nicety by the size of the flame on the portion of the stone the gutta-percha is placed on. This little mica is put there so you can see the flame and tell where you place your points, and get them as near the flame as you desire. The purpose of the mica is to prevent the flame from blowing out, if you are working in summer with the doors open and are in a draught; of course, in winter it is not necessary. You can take out the instrument and put it directly in the flame. There is no danger of overheating the gutta-percha, as I said before; and while you are getting your cavity ready, you are at the same time getting your instruments heated to the right temperature. There is a little arrangement advertised by the Whites, I think, which is called Dr. Howe's idea. He has a slab of soapstone with a handle attached. You pass it into the flame and heat it in that way; but this has all the advantages of that, and a great many in addition. It certainly is very effective and very convenient.

Dr. Littig.—Is the dry heat better than the moist?

Dr. Allan.—I have found it so. You get any heat you desire. I use Dr. Flagg's gutta-percha, and he has two or three different varieties. You require a greater range of heating surface to warm it. It seems to meet all the requirements for that purpose.

About two weeks ago I had an accident, and it set me thinking, and I determined I would not have the same happen again in my practice. About two years ago I exposed a pulp, capped it, protected it, and, as the crown was decayed, I put a Richmond crown on. The tooth broke about a month ago, and, in my haste in getting the root ready, I chipped out the little piece of oxyphosphate that I had placed over my capping, and re-exposed the pulp. If I had referred to my book I would have noticed at once that the pulp had been capped, and yet there was not the slightest indication about the tooth that it had been done; it seemed to me that some method ought to be adopted by which we could tell the condition of things. There is no better way than by having the material itself tell the story. In other words, I would have my gutta-percha or oxyphosphate, whatever I used, a bright red color. If that were generally practised, no dentist would ever commit the piece of folly that I did, of needlessly re-exposing a pulp that had once been exposed by cutting away the cover. By mixing a little

vermilion with the gutta-percha or oxyphosphate you get a perfectly red filling-material. This, then, I proposed to use immediately over the cap covering the exposed pulp. A tooth so treated tells its own story, and the danger of re-exposing a pulp once exposed, treated, and protected, will be reduced to a minimum. In excavating, if this plan should be generally adopted, the moment one sees that red signal he would know there was an exposed pulp, whether he had done the work himself or some one else had. I added some of the vermilion with the oxyphosphate powder, and found that it did not interfere with the setting when mixed with the acid. I do not see why that should not be a useful point in practice. We would then have a double record,—the record-book and the material itself. If it was always used for that purpose, we could not make the mistake I did. When I first thought of coloring the filling material, I wrote to Dr. Kirk and asked him what would be a negative powder that I could incorporate into the oxyphosphate or gutta-percha, and he wrote back suggesting vermilion. Fortunately, I had the vermilion in the office, and immediately tried it with this result.

Here is another little appliance. Most of you have used disinfecting and germicide fluids, and have them on your desk for use. You want something to hold them. This is handy, cleanly, and at the same time will keep the fluid from evaporating or the dust from getting in. These jars were made for preserving pathological specimens. The cap has a circular groove ground into it to place over in that way. It is practically a glass-stopped bottle, but there is no neck to the bottle. The fluid does not evaporate, the dust does not get into it, and it is always handy for use. As I stated in a short paper I read before the Boston Academy, I use bichloride in the strength of one to two thousand. I dip my instruments in it, fill my syringe with it, and it keeps the mouth-mirror and the syringe clean, as well as most of my instruments. I dip my scaling instruments in it, and I find it is very effective, and, having it in this cleanly shape before me, it saves time. These jars come in three or four sizes, and you can have them in almost any shape you please. From the shape of these (being an ordinary tumbler-shape) they are easily kept clean. You get these at George Wollman's, 116 Fulton Street.

A year or two ago I commenced practising with diamond powder for polishing enamel, and for a variety of purposes. There is about two dollars and fifty cents' worth in this little bottle that I have here; a little diamond powder goes a great way. I use a very

little of it mixed with Hindostan powder, and find it very effective. I use it with a copper point, or take an old burr, heat it and soften it, and take off the burr part so I have simply a rounded part, dip it in oil of cloves or oil of wintergreen and use it, and it is astonishing how rapidly it works, and what a bright, clean surface it gives.

Dr. Delos Palmer.—Is that diamond powder that you have in that bottle?

Dr. Allan.—Yes; it is cheaper than you would think, because you mix it with the other powder, and that saves it to a great extent, and it saves time enough to make the value of the diamond-dust a very small matter. In reference to the Hindostan powder, when the engine was first introduced it was a question what kind of stones would be most useful for polishing. When I was at college I spent a great deal of time grinding some lenses, and I found that R. B. Tolles, who was then one of the best manufacturers of microscope objectives we had, used Hindostan stone for grinding and polishing his lenses. I met him afterwards, and, in speaking of the matter, he said it was one of the most valuable powders he had ever used. The ordinary Hindostan powder will scratch, but the S. S. White Company, at my suggestion, have made two or three grades by precipitation, and the finer ones will cut and polish without scratching. Believe me, it is a matter of no small moment to finish off a filling or roughened tooth-surface without scratching. I believe these different grades of Hindostan powder are the best powders in the market for dental use.

Dr. R. I. Blakeman then read a short paper entitled, "Filling Roots with Gutta-Percha dissolved in Chloroform."

(For Dr. Blakeman's paper, see page 267.)

DISCUSSION.

Dr. Perry.—While approving very heartily this method of treatment, I would like to suggest, instead of the point of gutta-percha (which I have used for many years myself, and which I presented to the profession), for plunging into this softened mass, a point of gold wire, sharpened down to fit as nearly as possible the canal of the root, the larger blunt end of which is notched to make it possible to get hold of it for easy removal. I think one point that this gentleman has made is very good, and that is the ease with which the gutta-percha points can be removed. It is not very nice to cut and pull at a tender root, and I have always maintained that it is a good thing in a filling-material that it can be removed easily.

Those gold points are easily removed, and then very easy access is made to the end of the root, particularly by chloroform, as the essayist said. So you can be as gentle as a kitten if the time ever comes to remove them. Of course, we all hope we never will have to remove them. The penetrating and searching effect of that material, without doubt, makes one of the best fillings we ever have had. The only weak point is that it has not, as Dr. Howe several years ago pointed out, the antiseptic property, and when removed there will be a bad odor about it which shows that there is germ life present. The oxychloride of zinc can never be as nicely and as completely adjusted to all the inner parts of the tooth as that material, although we know it does not decay. If we want to be extremely fine, our work should not consist in filling the root-canal alone; we should fill as far as we can the tubuli which branch off from it. Of course, that is carrying the operation rather far, but still we can do it sometimes. Touch the dentine of an old tooth with a rapidly revolving burr, and you will stir up a bad odor. If that condition of a tooth can be prevented, it is very desirable.

Dr. S. E. Davenport.—I hoped that Dr. Blakeman would give the history of a case which I had the privilege of seeing in his chair, but as he has not, I would like to say a few words about it. A lower bicuspid in a gentleman's mouth had abscessed a number of years ago, and when Dr. Blakeman first saw it the apex of the root had become denuded and stuck out through an opening in the gum. Dr. Blakeman thought best to trim off the end of the root, and in doing so the side of the pulp-canal was opened into for a short distance. This canal was smaller than is usual in bicuspids of that size, and when the root was filled in the manner described it was an object-lesson, for we do not often have the privilege of seeing both ends of the tooth during such an operation. The solution almost immediately appeared at the thread-like opening, and in experimenting it was found that the least pressure upon the gutta-percha in the pulp-chamber would cause the solution to project from the opening near the apex.

Dr. Northrop.—From the essayist's paper this evening you would judge that filling the root-canals is a very nice, pleasant operation. I tried it quite a good deal twenty-five years ago, and I would like to ask if the essayist ever encounters any difficulty in forcing this gutta-percha up to the apex of the root without clinging to his instruments and making trouble. From the paper you would suppose that all we need to do is to wipe out the root, put a little soft gutta-percha in it, and a plunger carries it right up. Does he never

have the disagreeable result of the gutta-percha pulling out and making a mess of the whole thing? Does it always go up easily and neatly? It is a delightful thing when you get it there, but is it always as easy to do as he describes? I would like to know very much.

Dr. Blakeman.—I did not mean to convey the idea that this was an enticing operation, but rather to describe a way by which these minute canals could be filled. I have seldom experienced much difficulty in getting this solution into the roots of either the upper or lower teeth. Dr. Perry's suggestion of putting some pure chloroform into the roots before filling them is a good one; in fact, I think it is sometimes necessary with this method.

Dr. Allan.—Why do you fill those fine roots?

Dr. Blakeman.—I think it is necessary.

Dr. Allan.—Why is it necessary?

Dr. Blakeman.—I have had a few cases which I thought gave trouble because these fine roots were not filled. My reason for thinking so is that the trouble ceased after the roots were filled.

Dr. Northrop.—Will Dr. Allan not continue his remarks, and tell us how he disinfects the fine roots?

Dr. Allan.—I intended doing so. The cavity and roots of the tooth under treatment are dried out thoroughly, the rubber dam being first placed over the tooth by the use of bibulous paper and the hot-air syringe. Then the root or roots are cleansed out as thoroughly as possible, using cotton wrapped on broaches, etc. The drying process by these means can be made to extend well up into the roots. A fine platinum wire heated and passed well into the roots is very effective at times, but for the completion of the drying process I depend on alcohol (absolute is the best), which, by its strong affinity for water, will run into the roots, work its way up, and displace the water. By means of broaches passed into the roots, or a wad of cotton pressed over their open ends, this process can be expedited.

Dr. Smith.—Does capillary attraction act if one end of the tooth is closed?

Dr. Allan.—No; not at all, or only feebly along the sides of the tube, not filling it. Now, the alcohol is not only a powerful germicide itself, but is also a solvent for most of the essential oils, so that the oil will follow the alcohol and be made to take the place of the water or watery mixture originally filling the roots. Chemical affinity also acts powerfully, first in putting the alcohol into the roots, and finally the oil; and we have reason to believe that this

last force even takes the alcohol and oil into the dentinal tubes. In the case of celluloid dissolved in alcohol and ether, used to fill the roots, the same procedure is followed, except that in between the alcohol and the solution of collodion a mixture of two parts of ether and one of alcohol is employed. The collodion mixture is miscible in all proportions with this last, but not at all with alcohol.

Dr. Smith.—How do you know?

Dr. Allan.—I cannot speak positively. I do know, however, that by passing those broaches up and then taking the cotton and using it with the alcohol and essential oils, effective work can be done.

Dr. Perry.—Does the tooth give trouble within five years afterwards?

Dr. Allan.—I have not used it long enough to say. I have only used the celluloid a little over two years. It is soluble in ether and alcohol, just the same as gutta-percha is in chloroform. So far it has given much satisfaction.

Dr. Northrop.—Then I understand that the last speaker depends more on the cooking out than the washing out.

Dr. Allan.—I depend on both. They are both very valuable processes.

The President.—If there is nothing further to be said on the subject, we will hear from Dr. J. Morgan Howe on the subject of "Erosion."

(For Dr. Howe's paper, see page 241.)

At the conclusion of Dr. Howe's paper, Dr. S. G. Perry followed with one on the same subject.

(For Dr. Perry's paper, see page 249.)

DISCUSSION.

Dr. Perry.—The paper which I have just read was most hastily prepared, to comply with the request of the chairman of the Executive Committee to lead the discussion on the subject of erosion. It is not in satisfactory form to present to the profession, but I must let it go as it is, and for what it is worth.

Dr. Bulkley is the specialist to whom I applied for treatment of the eczematous trouble, and it was his great book on that disease that I read most carefully and most profitably. He preached the doctrine of open air, exercise, rest, and proper food, and to good purpose, as I have shown.

I called at his office this evening and asked him to come to our meeting to hear my paper. To my gratification he said he would,

though it would deprive him of meeting with one of his own societies which is now being held in one of the adjoining rooms. He is present, and I hope will discuss the subject from the physician's stand-point.

The President.—We should all be pleased to hear from Dr. Bulkley.

Dr. Bulkley.—When Dr. Perry asked me just now to go with him and speak on his paper, I told him that I disliked to do so because I knew nothing of the actual disease of which he wrote, —namely, the erosion of the teeth. However, of the truth of this theory upon which Dr. Perry is talking,—that is, that the uric-acid diathesis has much to do with many changes of the body, even of the teeth, hair, and nails, I am even more convinced than he is.

It is about seven years since Dr. Perry first came to see me professionally, and his case has been a most interesting one, and I can confirm all he has said in regard to the causes of his troubles and their relief by dietary and hygienic measures. He has repeatedly taken a mixture of acetate of potassa, nux vomica, and quassia, but this only aids in the cure, the other elements referred to being the most important.

The liver, as has been said, is the means in the system of utilizing the nitrogen taken in the food. It has several functions, the chief of which is the conversion of the part of the albumen of the food into urea, which is then excreted by the kidneys. If that metamorphosis fails to go far enough it will produce uric acid. Our idea of gout is that the uric acid thus introduced into the blood attacks the phosphate of soda and potash which renders the blood alkaline, and unites with the former in producing urate of soda, which is deposited in the joints. The alkalinity of the blood is due to the sodium and potassium phosphates with the carbonates. When uric acid is produced and poured into the blood, it attacks these phosphates and carbonates and seizes upon the soda and potash there.

In regard now to the part played in the production of erosions of the teeth by this acid state, we know that the uric acid circulates in the blood, and can be obtained in crystals and from the serum of a blister raised on the skin. In certain cases, also, urate of soda is found on the surface of the skin, having been excreted by the sweat-glands.

It seems, therefore, to me quite probable that a secretion from the mucous follicles may contain some of this same uric acid, which may then attack the phosphates of the teeth and so erode them.

This theory of Dr. Perry's seems to me so natural that I can hardly fail to express my perfect coincidence with it.

Now, while we talk of gout in connection with the subject under consideration, we must not confine our thoughts wholly to what is commonly regarded as gout,—namely, inflammation of one or more of the joints of the body, notably the great toe. We know that the gouty state begins long before there are the acute joint-inflammations, and continues in the intervals between the attacks of the same. I think the matter should be spoken of as the “gouty state or habit.”

There are many links of the chain reaching far backward; indeed, so far that the first systemic changes are often lost sight of. The process begins with the faulty metabolism, largely in the liver, and is principally due to errors in diet, although there are other elements of causation, such as lead-poisoning, nervous exhaustion, etc., which need not be discussed here.

The one thought I would throw out is that in searching for the acid cause of this erosion of the teeth, we should not content ourselves with merely inquiring if the patient has what he understands to be gout, but look for other evidences of the lithæmic or acid state of the system.

A long train of symptoms indicate gout, and it would not do for any one who is looking at a patient's eroded teeth simply to ask whether they have had gout alone. There are many other indications, some of which are quite as conclusive of the uric-acid diathesis as is gouty joint disease, but I cannot dwell on this here. Such are acid secretions with urinary deposits, neuralgias, palpitations, sick-headaches, and various other symptoms, which must be looked for, and be taken as elements bearing on the case. The simple denial, therefore, of patients having had gout is not sufficient, but other elements must be looked for and rectified if we would rightly remove the difficulty.

In regard to the diet, the point which Dr. Perry has so well brought out is certainly to my mind a very valuable one, and one most worthy of your earnest consideration.

The medical profession is, as you know, running into specialties, and forgetting far too much the broad principles on which all good practice must rest. I find many gentlemen going into the specialties of the eye, the ear, the throat, the skin, gynæcology, etc., and having no regard for the internal conditions of the system, but centring their thoughts and energies far too exclusively upon the organs which they especially treat. I look upon the dental pro-

fession as one great specialty in medicine, and I think that those practising it should be physicians in every sense of the word, with broad views, only having a more perfect knowledge of the contents of the mouth, its diseases, and how to remedy them, than of other parts of the body. The fault I find is, as I say, that the *specialists* are too often *exclusivists*, knowing or thinking far too little beyond their own limited field of practice. I think, therefore, that this discussion, in bringing up the matter of diet and hygiene in connection with diseases of the teeth, which have too often before been considered as local affections, is very important indeed. As we go further and further along in our studies as to the relation of one disease to another, we learn a great deal. In regard to skin-diseases, I cannot, at all coincide with my instructors in Vienna, who regard them almost wholly as local affections, and quite ignore constitutional relations and treatment.

As Dr. Perry said in regard to his own case, he was troubled with an eczema which was most positively of acid or gouty origin. I see many cases of this eruption which are partly gouty; others are neurotic, others scrofulous. You ask me why erosions of the teeth occur in some gouty persons, while others much more afflicted may have perfect teeth, and I cannot answer, any more than I could explain why one person has gout with an eczema, and another has gout and has no eczema; or why one gouty person will have bronchitis, while another is free: we only know that such is the case, and that, for reasons which are at present unaccountable, many local lesions in various parts of the body are often caused by systemic states.

It is quite a significant fact that in an adjoining room, where I should have gone to-night if Dr. Perry had not invited me here, there is a discussion with regard to bacteria and their real influence in the production of disease.

There are some who will there maintain that these micro-organisms are really the product, and not the causes, of disease, or at least that they manifest themselves only when proper conditions of system are present. In other words, the medical profession is looking away from the local causes which have been attributed to some diseases, and is again recognizing that the great changes which go on in the body are often of more real import than are local and external factors. Here in dentistry we are looking for diseases of the teeth beyond local causes, to some systemic cause. It is indeed interesting that the two branches of medicine should thus come so closely together.

Dr. Northrop.—As I was about to remark, if we accept the theory of Dr. Perry, which I would be happy to do, we could at once rid ourselves of all responsibility, and say to our patients, "Go to your physician," and we could absolve ourselves of troubles that come to us every day, such as sensitive dentine and erosion. I wish his theory might be correct. Two of the worst cases of erosion I ever saw were of a gouty, rheumatic diathesis; but I could give you almost a hundred instances, right in our midst, that are confirmed gouty people who spend almost one-third of their time in their beds and cannot get around, on account of gout, and yet their teeth are perfect. I will be bound that if Dr. Perry will go over his practice, where he will find one case of erosion with gout connected with it he will find one hundred cases of gout without the slightest particle of erosion. I cannot say that it is not uric acid that affects a tooth, because I do not know.

Last night a gentleman came to me with the canine tooth just as if it had been planed off. On the right side, above, the canine tooth was planed straight to an edge, and also the two bicuspidis. He has a gouty diathesis. Another had almost all of his teeth in that condition, but before he lost the teeth he died. He did not die of gout, but of Bright's disease. Of course, that was acid in the blood, too. While I should be most happy to accept that as a theory, I cannot and be satisfied that it is a real cause of erosion. I wish I could. Sometimes you will find a little patch on the enamel; sometimes it is the teeth planed off, just as I said before. I would like to say to my patients, "Go to your physician; it is uric acid in your system." I do not see one thing that we can use to cure it, except to go to the physician and have him rid the system of it.

Dr. Perry.—If it is not uric acid, what is it?

Dr. Northrop.—I don't know; but the cases are so different.

Dr. Bulkley.—You see one hundred cases of gout, and only one of them has eczema, and yet we believe that eczema comes from gout.

Dr. Northrop.—What evidence have you that eczema comes from gout?

Dr. Bulkley.—It yields to gouty treatment alone, and nothing else.

Dr. Northrop.—Can you cure gout?

Dr. Bulkley.—Certainly; you eliminate the element by the person living correctly, and the gout ceases. You do not eliminate the tendency to gout, because the liver is at fault, and, if the person taxes it, the gout will recur.

Dr. Lord.—Mr. President, I have brought to the meeting models to show some of the results of the disease under discussion, and will just say a few words about the case, without making much comment as to the cause.

This may be said, I think, to be a case in which the disease has made great havoc with the teeth, and the work appears to be still going on.

The pencil-marks on the models show that eighteen of the remaining twenty-seven teeth are affected,—the most of them very badly, as is shown by the extent of the pencilling. As is seen, the whole of the labial surfaces of eight of the teeth are quite gone; and the models show that the incisors do not come in contact by one-tenth of an inch, and the canines and bicuspid on the right side do not meet by quite a little space, and the corresponding teeth on the left side only touch in part, so that the molars are about all that remain for mastication.

One of the superior centrals and the canine standing beside it, owing to the early loss or non-appearance of the lateral, are not affected in the least on the labial surface; but the ends of the teeth are wasted away in the same manner as the other front teeth.

I have been able to cover the surfaces affected from time to time, some of them with gold, and for others I have used oxyphosphate with a small quantity of alloy filings mixed with it, as I find that fillings of this material wear longer when the filings are added to it. The disease has continued, however, to affect the tooth-structure around the edges of the fillings, showing its persistence.

The patient is between seventy-five and eighty years of age, and is of at least more or less a gouty and rheumatic diathesis. When he first came into my hands, some twelve years ago, I attributed much of the loss of the enamel on the labial surfaces to the excessive use of the brush, as he gave me to understand that he was a hard brusher; but it has been clearly shown since that the brush was not the cause of the trouble.

I may say that I have never known a case in which the disease in question affected the lingual surfaces of the teeth.

Dr. Remington.—I saw a case three days ago where it attacked the lingual surfaces.

Dr. Bulkley.—I think the point is that we get the uric-acid indication long before we get the more active manifestations of gout. The contracted kidney is one of the latest links in the chain although apoplexy, etc., comes after that, of course. We get certain cases of neuralgia which are gouty. I believe the erosion of the

teeth can come long before the person has any pain in the toes or in the joints. If they will modify the diet before the severely acid state is produced, then the action ceases.

Dr. Howe.—Dr. Jarvie sent word that he was very anxious to be here to-night, but could not come. He sent a series of three models of the effects of erosion on the teeth in a certain mouth. They show the progress of erosion in one mouth from 1882 to 1889. He says the lady is now dead, but that he watched the case all the way through, and that he particularly inquired, as I understand it, for rheumatism or gout, or anything pointing in that direction, and that there never was any history of any such thing in her case. These models are here, and any one interested in them can look at the models.

Dr. Littig.—Although we may not see that there has been any particular indication of gout, I never saw a case of erosion that there was not that peculiar, nervous condition of the patient that is the forerunner of an organic disease. I think that is one of the points that has been overlooked to-night.

Adjournment.

JOHN I. HART, D.D.S.,
Editor New York Odontological Society.

ODONTOLOGICAL SOCIETY OF PENNSYLVANIA.

THE subject for discussion, "What are the best compositions for temporary fillings for a minimum period of three years?" was then considered. It was opened by

Dr. Peirce.—In considering the advisability of materials for temporary fillings, we must take into consideration the location of the cavity to be filled, and also the condition of the tooth. Those two things would modify my practice very much as to the selection of material. We have, of course, several preparations used for that purpose, and used very advisedly in certain teeth. If I had a cavity in the central incisor of a child, for instance, or where the patient was not able to stand a gold filling, or where there was not sufficient room to put in a gold filling, as on the mesial or distal surfaces, I should prefer to place in a filling of gutta-percha or phosphate-zinc or chloride-zinc cement, believing it would be very comfortable and thoroughly protect the tooth from decay as well as any other material, being attended with less tax upon the patient

or the endurance of the child. On the other hand, if the cavity was on the masticating surface of the first molar, and I desired to insert a temporary filling, then I should prefer a zinc-phosphate filling, believing it would give more durability and would as well also protect the tooth from further progress of caries. Where the cavity is on the mesial or distal surface, whether anterior or posterior, where I desire a filling for temporary use, lasting as a minimum three years, I am in favor of using gutta-percha. With deciduous teeth I prefer the pink, because it has some advantages over the ordinary white gutta-percha. The pink gutta-percha in a child's deciduous tooth adapts itself at a low temperature to the cavity, and also has a degree of resistance that the white does not, because of its greater elasticity or the less amount of mineral substance in the material. I think these three materials—pink and white gutta-perch and zinc-phosphate—are the best. The practice must be varied according to the location of the cavities, and also by the age and endurance of the patient. I have had very good results with pink gutta-percha where I could do little more than wipe out the cavity and warm a pellet and press it in. With an irritable patient and disinclined to have anything done with the cavity, and where it is impossible to keep it dry, take out the softened part and pack in pink gutta-percha. In my hands it has produced very good results, protecting the teeth from further decay for a period certainly of three or four years.

In permanent teeth, where color is of some importance, I should use the white, but that requires more softening and does not have for the masticating surface so resisting a capacity as the pink. I meet with a great many fillings, placed in by myself and others, of zinc-phosphate, but they vary so much in different mouths that they are not reliable. I see fillings very often that have been in for three, four, or five years, and they keep their integrity well, but in other cases they have dissolved and grown imperfect at the cervical margins quite early after being put in; so that I do not consider phosphate of zinc so reliable in cavities bordering on the cervical margins as I do pink or white gutta-percha. But one of these three materials is used invariably where I want a temporary filling lasting from one to three years.

Dr. Jefferies.—I have pursued the plan Dr. Peirce has stated, and I find it impossible to fix upon one material. Different cases require different treatment to attain the best results, and the course he has pursued has been the same as mine, except in some where the decay is large between the teeth and it is necessary to use

zinc-phosphate to make it last the longest period,—for a minimum of three years. I combine it with gutta-percha at the cervical margins, which has been the practice of a great many. In that way, as that seems to be where it is first dissolved, we get the best results. In other respects my practice is exactly the same. I use gutta-percha for front teeth and cement for back teeth, or in some cases, as on the masticating surface and where the appearance makes no difference, I use very frequently amalgam. For a temporary filling I think there is nothing better than pink gutta-percha. I often use it between children's teeth. If it wears out it is quickly and easily renewed, and it will prevent forcing of the food down between the teeth and impinging upon the gum, by reason of its filling up the entire space between the teeth.

Dr. Peirce stated that a year or so ago Dr. Brubaker tested some zinc-phosphate pellets for him, and it was found that lactic acid would destroy the zinc-phosphate very rapidly, while the pellets in the acetic acid for a year or so had suffered no visible disturbance. The doctor thought it was a fact worth putting on record that lactic acid dissolves the cement very rapidly, while acetic acid will not destroy it.

Dr. Truman.—This question is such a narrow one that it is difficult to talk about it. Of course there are two or three materials we can use,—gutta-percha, tin (as temporary filling), and zinc-phosphate. Those three are practically the only ones we have. I think possibly red gutta-percha is not affected by micro-organic life, while I am convinced white gutta-percha is. It decomposes on the surface with considerable rapidity. The red is, I believe, colored with vermilion; that may have a retarding influence in the development of micro-organisms. I know of no other reason, because they are practically the same. We all know that red gutta-percha will remain intact in cavities for almost an indefinite period.

I think this question of temporary fillings can hardly be considered at all without broadening the subject somewhat. It seems to me we ought to take into consideration the character of the tissue we are working upon in using temporary fillings of any kind. Their mission, of course, is to protect the teeth for a limited period. Now, how is it with teeth where the pulp is nearly exposed? Gutta-percha appears, from its expansion, to have a tendency to irritate the pulp. I think in many cases this effect is noticed, and yet we have nothing better from its lack of conductivity to thermal conditions, in children especially from twelve to

fourteen years of age. I think there should be placed on record a protest against the use of gold and those high conducting materials at any age before twenty, in the majority of mouths. We always forget, I think, that the dentine of each tooth is made up of a series of tubuli, which contain organic matter capable of conducting impressions, and will place in almost anything that we may have at the moment most convenient; but we cannot do it with any degree of safety, and therefore I think we ought to avoid such temporary fillings as zinc-phosphate in extremely sensitive teeth. Oxychloride of zinc is always more or less dangerous. I prefer to paint the walls with chloro-percha and then cover with zinc-phosphate, but I never fill temporarily on the proximal surfaces without making a compound filling. To me it is a very great error to depend upon any one material for filling in teeth of that kind. We have, as has been observed by Dr. Jack, a possibility of acid destroying the filling at the cervical border, and that fact should always be borne in mind. The red form of gutta-percha will resist the action of micro-organisms at that point better than any other. If the walls are coated with a thin layer of chloro-percha and then a layer of tin, and then upon that you build zinc-phosphate, you have very nearly a permanent filling. I am well aware from clinical experience that zinc-phosphate will dissolve in some mouths. I prefer to place in tin as a temporary filling where it is possible to use it.

Dr. Neall.—If I understand the question, it is, What is the best temporary filling for a minimum of three years? It strikes me that that verges on a permanent filling. I have seen many fillings supposed to be permanent that have not lasted that length of time.

I give a good deal of praise to white gutta-percha. I have used red largely, and for two years past have employed Flagg's high-heat gutta-percha, and I have been very well pleased with it, even when used on the masticating surfaces. Sometimes a filling will last not only three, but eight, years with this agent. The qualities are brought out largely by the character of fillings, as I have learned by experience. The rubber dam should be put on carefully, the cavity dried and shaped as if it were to hold a metal filling. The first piece I warm over a pipe or spirit-lamp and make it quite soft, and pack in one after another, making the first piece adhere to the cervical border, and then trim and rub down with chloroform. My experience leads me to regard Flagg's high-heat gutta-percha as the best temporary filling, verging upon a permanent filling.

Dr. Peirce stated that he attributed the value of red gutta percha

to the fact that it had vermilion in it, which was an antiseptic, and that it had a less amount of mineral substance than the white.

Dr. Jack mentioned a case where electric wires had been insulated with gutta-percha, which were placed underground, and it was found that wherever the wires passed beneath an oak-tree the insulation was destroyed. On investigation it was discovered that it was attacked by a low form of life which disintegrated it.

Dr. Bonwill.—I think the question was not properly framed. There are so many conditions of the teeth to be considered, and such a variety of circumstances attending the different cases, that no certain substance for filling could be named applicable to all. I favor the use of gutta-percha, and also other materials, as the different cases might require.

Dr. Bassett.—In my practice gutta-percha has occupied a very large place, but I have never been able to procure anything for a filling that would absolutely preserve a tooth for a minimum of three years. I am glad to repeat what Dr. Truman has said about the protection of certain parts of the cavity, preparatory to filling with zinc-phosphate. For me it has always failed very quickly at the cervical margins, so that I have come to rely on it less and less as a temporary filling, except in certain kinds of cavities. Gutta-percha will, for me, under all conditions, preserve the teeth better than any of the other so-called temporary fillings; but, of course, it has the fatal defect of wearing out wherever there is much mastication upon it, and also in proximal cavities. We are surprised often in finding fillings that we place in, supposedly for a few months, to last for many years. There are so many things involved that it seems impossible to set any rule for a certain length of time.

Dr. Boyce.—Dr. Neall asked the difference between gutta-perchas. It is true there is as much difference in them as there is between day and night.

The great mass of white gutta-percha is loaded with white wax or chalk, and is almost valueless. I have had pink gutta-percha become soft, as though it were rotten. So I have white gutta-percha. But, as for making it last three years, it depends upon the structure of the teeth and who is using the material.

With the great mass of mouths, especially children's, it is my sheet-anchor in preserving them from six to twenty years of age. I have a lady now in my charge with a filling on the distal surface of the second bicuspid; she masticates on it, and there is no wear. Dr. Dixon put it in twenty years ago, and yet when I place in

phosphate fillings I want to see them in six months, and if they are there I am very well pleased. I cannot explain why it is different in different mouths, nor why it is called high-grade gutta-percha.

Dr. Faught.—I think that it is impossible to speak of any filling as being either temporary or permanent, as varying conditions make it impossible to name the time of its continuance, except, possibly, as the word is used by Dr. Ottolengui, to indicate a filling placed to cover dressings used in medication of teeth, or to tide over until convenient to fill, or some such purpose. Materials to be used can only be determined by the careful consideration of pathological conditions presented. We may discuss the mechanical and chemical properties which any material has in itself to resist disintegration, but no statement can be made as to the time these qualities will remain inherent.

Dr. Head.—I think it would first mean a great deal of skill to put it in, and, in the second, great judgment in choosing materials to make it last three years, unless there was absolute control of the tooth, and the formation of it when it was made. Gutta-percha is supposed to be a temporary filling, but in many cases it is far more permanent than gold. Oxyphosphate is supposed also to be a temporary filling, but in many cases it is more permanent than anything else we can use. It seems to me the thing we could best add to a filling, to make it last certainly for three years, would be brains.

The question as to the "best methods for overcoming sensibility of the dentine by local or general means" was then taken up.

Dr. Gaskill opened the subject. He stated that he had not been able to find any remedy that was reliable in all cases. Chloride of zinc he generally used. He mentioned a case where a piece of cotton caused such pain that he could not proceed. After putting in a small crystal of chloride of zinc, he was able to go ahead with comparatively no pain. The patient stated it was the most comfortable operation she had ever had performed.

Dr. Faught stated that he had used chloride of zinc with good effect. He had also used nitrate of silver with good results.

Dr. Truman.—To properly consider this subject, physiological conditions should be taken into consideration. It is impossible to regard the pulp as simply the remnant of the original tissue in the development of the teeth. What occasions this sensibility? All are aware there is scarcely any cavity of the mouth that micro-organisms are not in process of development, and the product being

acid, constant irritation is produced, and in proportion to the density of the tooth will be the sensation. In soft-structured teeth we find increased sensibility. If we take into consideration the fact that we have not only the normal irritation of the tube contents, but also that produced by the acids spoken of, we gain a comprehension of the philosophy of the treatment of sensitive dentine. It means that we must modify the increased sensibility by using some agent that will neutralize the acidity. It was that which led me a number of years ago to recommend the use of alkalis in preference to any of the escharotics. For this purpose bicarbonate of soda is used. If this be applied properly to neutralize acidity, there will be a marked change in the sensation.

I have observed, from microscopic examination of chalky teeth, that the organic substance of the tooth is not immediately destroyed by caries, but remains with the fibrillæ in the cavity to be irritated by the increasing acidity. The fibres have not been destroyed, as in teeth of dense structure. They can be seen permeating the organic substance, which remains as a mass in the cavity, and readily raised by the excavator. With patients whose occupations bring them in contact with saccharine or acid products at confectionery-stores or vinegar-factories, I always prescribe an alkaline wash for the teeth, at least a week before commencing operations, to be used daily.

To my mind chloride of zinc is a most dangerous agent to place in a cavity. I have always dreaded its escharotic effects. Its destructive as well as its coagulating property is apparently limited only by the quantity of albumen. It is peculiar in its action. I have tested this thoroughly in minute capillary tubes. That it will be carried to the pulp sooner or later it seems to me there can be no reasonable doubt.

A large portion of the so-called obtunders have arsenic or cocaine in them. Cocaine, to be of value, should be combined with chloroform or similar agent, but its possible effects should be well considered. No one, it is supposed, would inquire whether arsenic should be placed in a tooth. There is no agent that could possibly be worse. The death of the pulp is a certain result.

The President stated that the question was asked that the consensus of opinion might be brought out against it.

Dr. Jack.—For ordinary sensibility I find carbolic acid, combined with oil of cloves, sufficient to alleviate, but in many instances the decalcification of the dentine produces a state of hyperæsthesia of the tubular contents which demands different treatment. No op-

eration can proceed where the degree of sensibility is such that the slightest touch is unbearable. In these cases the local means I have found most efficient are desiccation and zinc chloride. The applicability of these agents is based on the well-known principle that if a tissue is deprived of one of its elements its normal function is impaired or destroyed.

As the use of heated air is the simplest and least painful means, I first try this. I always apply the rubber dam. The cavity is bathed with absolute alcohol, when compressed air is passed through a heated air-syringe, the bulb of which is crossed by perforated diaphragms. The air in passing becomes heated, and should be brought into contact with the tooth a little above the blood-heat. If the nozzle be held too far away the current takes with it by friction the adjacent air and is made too cool; if it is placed near, the heat is too great. The application requires to be repeated several times in some instances. Often the result is extremely satisfactory; at other times the dentine will not become dried, and there is no result.

When this is the case I do not hesitate to employ zinc chloride where the cavities are comparatively shallow, and in a long experience I have not encountered the death of the pulp from this cause. The method I follow is invariably to use rubber dam. The cavity is dried and a crystal of the salt placed in it. If the deliquescence is not immediate I add a little previously deliquesced zinc chloride and await the result. Frequently one can tie up the rubber water-tight, tuck the bag in the cheek, and go on with another case.

As the extreme sensibility of the tooth is in the part immediately beneath the soft caries, it is important to remove this, if we can, to allow the chemical to act at once where most needed, otherwise two applications may be required.

When the pain has ceased I wash out the cavity and proceed to prepare it, knowing that if the instrument reaches sensibility it has passed beyond the sphere of action of the chloride, and that any uncombined salt will have been washed out by the water and saliva.

In some cases there is not the least action by the zinc chloride, which can have but one explanation, which is that the vital force of the tissue has been sufficient to prevent the combination with its albumen. In these instances, when it is necessary to prepare the cavity and it will not receive a temporary filling of any kind, I give ether and operate at the first stage of anæsthesia whenever I can. At this stage it is more satisfactory, as the patient in this

condition is able to respond to questions. I have in this stage frequently prepared the most sensitive cavities, giving a few inhalations at each recurrence of sensibility. Thus far I have experienced no indications of shock, and much less nervous depression than would follow an attempt to prepare a cavity without ether when the use of it is indicated.

Dr. Bonwill spoke of the necessity of having good sharp instruments, in order to lessen pain in operating.

The query demands an essay.

The various conditions of the dentine, involved as it is with the pulp, require antiseptic treatment.

I never use arsenic except for the destruction of the pulp. It is the best agent known, used with proper judgment.

I have tried many obtunders from electricity (to-and fro current), carrying it from the nerve centres to the periphery or pulp, counterbalancing the pain. It will do it in many cases.

I find now that sharp excavators, burrs, and spear-pointed drills, accompanied with a very quick, full, deep inhalation, made immediately before the instrument is placed on the sensitive bone, accomplishes good results. The stroke of this should be finished before the patient fully charges the lungs. Then desist until the lungs are again inflated, thus changing; for if the cutting begins at an improper time the patient will not inhale quickly.

To produce a more profound effect, have the patient breathe one hundred to the minute, and, while yet doing this, excavate as freely as desired. The former plan generally suffices. Never remove all the carious portion at the first sitting.

Take a piece of paper charged with creosote or carbolic acid, fit it over the bottom of the cavity, and place upon this warmed gutta-percha (pink base plate), and then let it alone for weeks and months, which will not obtund further sensibility, but wedges the teeth apart by the pressure of mastication.

The operator should be very quick in his movements; all instruments should be convenient. Three things are essential to success,—time, gutta-percha, and creosote. Hurried excavation and filling at the same sitting will not answer.

I would never use a hypodermic injection of any kind. I have used chloroform only in moderate quantity and in special cases.

Dr. Head.—Many remedies satisfactory in one practitioner's hands are not so in those of another. When cocaine was first introduced, a two-per-cent., then a four-per-cent., and finally a fifty-per-cent. solution was used. The method now generally pursued is that

of desiccation, in conjunction with chloride of zinc; also an alcohol spray, using it after the rubber dam is adjusted. By this treatment the operation had been performed, where before a piece of cotton applied caused the greatest pain.

Dr. Luckie thought that all the obtunders placed on the market were a vanity and vexation. There is none that will answer in all cases. Cocaine had never been very satisfactory, and he attained the best results by desiccation and by using very sharp instruments. He had used etherization with good results.

After the close of the discussion it was unanimously resolved that it is never expedient to use arsenic in any form for deadening sensitive dentine.

Adjourned.

J. ATKINSON MCKEE, D.D.S.,
Editor Odontological Society of Pennsylvania.

Editorial.

THE THREE CONVENTIONS.

THE year 1893 promises to be a memorable one in the history of dentistry and medicine, if all the proposed conventions are carried to a successful issue. In any event the professional feeling will be stirred as never before in the same period of time.

The importance of these efforts cannot well be overestimated, and they mark an epoch in professional thought that may well claim the serious attention of all interested in progress.

The question whether these will be productive in great results or otherwise does not enter into the calculation. That they will have a marked effect there can be no question; but whether this will be noticeable, there will still be the important fact remaining, that three conventions have met, composed of various nationalities, to consider profound scientific problems. This, of itself, is a most promising outlook. It will level prejudice, broaden thought, contract geographical lines, and bring the professional ideas of the world more in harmony. At no time in the world's history has there been conditions warranting such an effort. Language has always been a bar to international progress, and to some extent this

will remain; but the levelling influences which have been at work for the past half-century have made practicable that which previously would have been impossible.

The only fear that presents itself at this time is the possibility that the work has been overdone. If time demonstrates that three conventions can be held within a month of each other, and at widely separated points, and be sustained both in regard to quality and in numbers, it will be as remarkable as anything else in this exhibition year.

From present indications this will be the result. The effort to make that at Rome equal to former meetings of the International Congress of Medicine gives promise that it will not be inferior to those that have preceded it. Whether the section of "Odontology" will do as well as in former years must depend largely upon the efforts of our European confrères, as it is not probable that many from this side will be able to meet them. The demands of the World's Columbian Dental Congress and the Pan-American Medical Congress will absorb the efforts of the large majority of the workers in America; but with the whole of Europe to draw upon, there should be a meeting in Italy nowise inferior to those heretofore held.

The outlook for the two important convocations at Chicago and Washington is satisfactory. There has been, necessarily, some friction; but this will be lessened as there is a better comprehension of facts. Some of the mistakes will, doubtless, be corrected. If this be not possible, there can be at least an earnest effort to make the former a success in spite of errors of judgment.

We have tried to impress upon the dental profession, in former articles, the importance of setting aside all predilections, and uniting on this single effort, regardless of this or that man, but solely in the interest of the profession of which we are all a part. If this be done without reserve, then will its work redound to the honor of the dentists of this country. We cannot afford to permit personal prejudices or selfish bickerings to intrude their injurious influence. They must be laid aside and the labor be taken up unselfishly, sacrificing personal feelings upon the altar dedicated to the highest good of the entire body. In this spirit alone can we hope to succeed.

The Pan-American Medical Congress is to dentistry an incident. It was conceived, as a whole, in the proper spirit; but whether it were wise to bring it in competition with the larger convention at Rome may be a question. But be this as it may, it will be held, and there is apparently no reason why the "Oral and Dental Section" should not be an entire success. The financial drain which the

Chicago Exhibition will make upon those who will feel forced to be there will, doubtless, have an effect to prevent many from visiting Washington; but there must be a large residue who will divide their interest between these two places. While it may not compare in numbers with either of the other two conventions, there is no reason why the quality of the work should be in any degree inferior. All of the foreign contingent will desire to visit Washington, and this in itself should insure a good meeting. The season during which it is held is generally delightful, and the city of Washington is a perpetual exhibition, besides being one of the most beautiful of the cities of the country.

The untiring energy which has been manifested in preparing the preliminary work of these meetings will, we are assured, find no faltering as the time rapidly lessens before the gavel calls to order. If this period be devoted to earnest work, there is no reason why September should not close with the feeling that the professional labor of 1893 has been well done, and another step taken in the onward march of ideas.

DR. ALLPORT DEAD.

DR. W. W. ALLPORT died at his residence in Chicago, March 21, after a prolonged attack of erysipelas.

We have not the space to do more than notice this important and sad event, but will give a full account of his life-work in the May number.

TO CONTRIBUTORS AND CORRESPONDENTS.

WE would ask special attention to the address of the editorial office of this journal on the front cover.

The editorial and publication offices are distinct and separate, so that matter intended for the former and sent to the latter requires remailing, involving delay.

We hope our friends will kindly remember that all contributions intended for the editor should be sent to 3243 Chestnut Street; exchanges to 716 Filbert Street.

Bibliography.

CATCHING'S COMPENDIUM OF PRACTICAL DENTISTRY FOR 1892. By B. H. Catching, D.D.S., Editor and Publisher, Atlanta, Ga.

The dental profession is again under obligations to the faithful compiler of this valuable addition to its standard literature. It appears for 1892 with improvements in many directions. This was to be expected, as such a work requires special training; and as no standard existed as a guide, the editor is to be congratulated that he has been able to make it a necessity for those unable or unwilling to gather ideas from a mass of material, and, as it were, embalm them for future reference.

To the superficial reader this may seem a task readily accomplished, simply requiring acute observation and careful culling. When, however, it is understood that the condensation means not only care in reading, but a power of apprehending the idea of the writer, it assumes an altogether different character. That Dr. Catching has succeeded in this is abundantly proven upon the well-filled pages. It is not his fault that the matter does not seem to show any great advance in dental work.

When the large amount of printed matter is laid before professional readers monthly, the natural feeling is that marked progress is being made in every direction, but the skilled dissector of ideas lays a ruthless hand on this opinion and exhibits comparatively meagre results for the year, and forces the question, Are we making the scientific progress we should?

Not the least valuable part of this compendium is that it represents us as we are, and while the exhibition may not increase self-satisfaction with our work, it may, it is hoped, lead to increased activity and thoroughness.

A compendium of dentistry, it seems to the writer, should have a broader scope than has been given to this. Dentistry to-day is not confined to the English-speaking races, nor do they have a monopoly of the best work. It has the entire civilized world for its field of labor.

It, therefore, would seem appropriate—even more than that, necessary—to glean from all parts in order to make such a work a true compendium of “practical dentistry.” If the scientific side be

added to this, as it should be, it will be still more difficult to confine it to any one country.

The difficulties in accomplishing this are many and may be insurmountable, but if the entire field of dental periodical literature could be treated as carefully as the work has been done for this country, it would add immensely to succeeding volumes. As it is, it lacks just this to make it of interest to the scientific worker.

While it has its limitation as an exponent of the dental thought of the year, it remains invaluable as a work of reference within the lines the compiler has laid out for himself.

The general make-up is very satisfactory and reflects credit on all concerned in its publication.

Obituary.

DR. GEORGE WATT.

THROUGH the kindness of the publishers of the *Ohio Dental Journal*, we are enabled to give abstracts of the work of the life of Dr. Watt, prepared by Dr. J. Taft for that journal in 1888.

"Died, at Xenia, Ohio, February 16, 1893, of locomotor ataxia, Dr. George Watt, M.D., D.D.S., in the seventy-third year of his age.

"Dr. George Watt was born on March 14, 1820, on a farm eight miles east of Xenia, Greene County, Ohio. His father, Hugh Watt, was born in the north of Ireland of Scotch parentage; his mother was a native of Western Pennsylvania, and was also of Scotch parentage.

"He first entered a country school at seven years of age. Schools at that time were very primitive and were generally continued only for three or four months during the year. He remained at the family home till October, 1835, when he left and went to Adams County, Ohio, to enter a boys' academy, established and conducted by Rev. William Taylor.

"In 1840 he entered a college at Ripley, Brown County, Ohio, and remained about a year; leaving there in 1841, he returned to Greene County, and there engaged in teaching and the study of medicine, in which he had the late Dr. Samuel Martin, of Xenia, for his preceptor, with whom he not only had superior instruction in medical science and practice, but also had there inculcated, in a

receptive mind, the views of the dignity and importance of medical science and practice that have ever characterized him from that time to the present.

"He practised with and for his preceptor about one year, after which he removed to Bentonville, a small town in Fayette County, Indiana, where he soon established an excellent practice, especially for a new country. Not being satisfied with his attainments in medical science, he entered the Medical College of Ohio in 1846, and graduated in March, 1848.

"April 17, 1845, he was married to Miss Sarah Jane McConnell, who was a native of Greene County, Ohio.

"Early in the year 1852 he entered upon the study of dentistry. He was well prepared for such a course of study by his medical knowledge. After some time devoted to this specialty, he formed a co-partnership with J. Taft, of Xenia, Ohio, for the practice of dentistry, which continued for many years. One branch of science to which Dr. Watt had given much attention during and after his medical course was chemistry. Some idea of his proficiency in this direction will be apparent when it is remembered that he had an unusual aptitude in and liking for this branch, and also that he had for his preceptor that noted chemist and philosopher, the late lamented Professor John Locke, who was for many years a teacher in the Medical College of Ohio. In 1853 he prepared and delivered a course of lectures on chemistry in the Ohio College of Dental Surgery. And though Dr. Elijah Slack, M.D., LL.D., had delivered a course of lectures on chemistry in the same institution for one or two years before, yet this effort of Dr. Watt was the first attempt to adapt a course of lectures on chemistry to the need of the dental students, and he was the first to prepare and deliver such a course. All work in this line done before him was simply such as was given to medical students. During the time in which this course was delivered he was not only a teacher hewing out a new course for himself, but he was a member of the class he taught, so that he was in the double capacity of a teacher and a pupil.

"He graduated with his class, receiving the degree of Doctor of Dental Surgery at the close of the term of 1854.

"Immediately after this he resumed the practice of dentistry with Dr. Taft. So well recognized was his ability as a teacher that he was not long permitted to enjoy the quiet and comfort of a town and country practice, for in the spring of 1855 he was elected Professor of Chemistry and Metallurgy in the Ohio College of Dental Surgery, which position he occupied for several years.

"He became a member of the Mississippi Valley Dental Society in 1852.

"He, with Dr. Taft, became the owner and editor of the *Dental Register of the West*. This relation was maintained for many years, and was only relinquished when Dr. Watt's failing health rendered it imperative. But he has always, and even after this severance, been a liberal contributor to the literature of the profession.

"In the autumn of 1860, in the time of the great trial of our nation, he promptly tendered his services, so far as possible, for its rescue; however, he was not accepted until May, 1864, when he was made surgeon of the One Hundred and Fifty-fourth Regiment of Ohio Volunteer Infantry.

"His efficiency in that position will be well understood when it is stated that the sanitary record of his charge was better than that of any other Ohio regiment.

"He was mustered out September, 1864, after being disabled by an injury to the spine, having been crushed by a falling wagon, which resulted in locomotor ataxia.

"After his return from the army he entered into practice, as his feeble health would permit.

"In the autumn of 1865 he formed a partnership with Dr. N. W. Williams, after which they conducted a practice in Xenia for about one year, and they established a branch office in Cincinnati, of which Dr. Watt took charge.

"In 1868 the firm of Watt & Williams purchased the dental depot of J. S. Walters & Co., of Cincinnati. This business they conducted successfully, in addition to their dental practice, for about three years, when they sold the depot to Spencer & Moore.

"During this time his health was becoming more feeble, and his strength at times seemed well-nigh gone, and it was deemed best that he should retire and no longer attempt the active duties of practice. But he was not content to be idle. In 1881 he took the editorship of the *Ohio Journal of Dental Science*, a monthly journal of about fifty pages.

"In 1867 he published a volume entitled 'Watt's Chemical Essays,' in which are published the principal papers which he has written on dental chemistry.

"Quite a number of these papers have been published in various journals, not only of the dental but of the medical profession as well, and even in some of the leading newspapers of the country. Unfortunately, the syllabus of his series of lectures on chemistry has never been published.

"He has occupied a number of positions of prominence in addition to those already named. He was Vice-President of the American Dental Convention. He was elected President of the American Dental Association on the same day he became a member, the only instance of the kind on record. He was President of the Ohio State Dental Society the first two years of its existence; was twice President of the Mad River Dental Society. In every responsible position he ever occupied the duties devolving on him were discharged faithfully and efficiently."

His widow, Mrs. S. J. Watt, and their adopted daughter, Mrs. Sillito, are the only survivors of his immediate family.

The funeral services were held at his late residence on Saturday morning, February 18.

Notes and Comments.¹

ANY one who entertains a real interest in his profession, with a desire to keep apace with the times, will gladly contribute his mite to the onward movement, and will as gladly welcome all criticism. Criticisms and controversies, when carried on with judgment, are wholesome: they are the door-way to true progress and knowledge.

"To him who works in the right direction all things are possible, and the higher he places the limit of his attainments, the greater his attainments will be."—*Dr. Eugene Talbot.*

THE HERBST METHOD OF TREATING PULPS.—According to some observers, the long-hoped-for day has come when we may conscientiously leave root-canals to look after themselves. We remember hearing, some few years back, of the wonderful properties

¹The assistant editor solicits contributions for this department,—new methods, new remedies and formulas, or any short practical note which may prove of value to the practitioner or student. Address 1506 Arch Street, Philadelphia.

ascribed to cobalt by Dr. Herbst. But we are also under the impression that somebody analyzed a sample and found that the substance was principally arsenic. Certainly a single application of arsenious acid does not always devitalize the whole pulp, and the Herbst method consists in removing the soft tissue as far as the entrance to the canals, with antiseptic care, and then burnishing a tin or gold floor on the bottom of the pulp-chamber. We publish elsewhere an abstract from a paper written by a well-known practitioner in New York, who apparently, after vigorously opposing the method, has become a convert. His communication met with sharp criticism in the discussion which followed. It has also afforded an opportunity for an editorial protest in one of the journals, the writer of which amusingly says that he is unable to see much difference between the "new method" and the slovenly operations of indolent or ignorant operators everywhere, especially in England and Germany!—*Editorial in British Journal of Dental Science.*

WEIGHTED RUBBER.—A writer in the *Items of Interest*, requesting information concerning weighted rubber, says, "We would like to know whether weighted rubber is more irritating to the gums than ordinary rubber? A late trying experience suggests the inquiry."

Weighted rubber is more or less irritating to the mucous membrane. It is always the best practice in packing, where this rubber is used, to place a layer of the ordinary rubber next to the cast, and owing to the superiority of the strength of the latter it is better to pack a small portion around the pins of the teeth.

EXTRACTING.—The brutal and unprofessional practice of some dentists of extracting roots by cutting through the gum and process with the forceps, to grasp a decayed root, has no excuse, and yet it is a common thing to do when the patient is under the effect of gas. Not infrequently the fifth nerve has been severed and facial paralysis induced by too deep a dip of the forceps in the extraction of a wisdom-tooth. Cutting through the gum and process to extract a root below the free margin of the gum is malpractice, and a person so disposed can recover damages for improper laceration of the mouth.—*Extract from a Dental Essay.*

That is simply catachrestic nonsense. There is no tissue that

so easily heals as that of the jaws. It is sometimes absolutely necessary to remove a root that is embedded in the jaw, when there is no way of doing this but by excising the alveolus. Is a surgeon never justifiable in cutting to open an abscess, or to remove a tumor?

What does the writer mean by "the fifth nerve"? Does he imagine that there is danger of wounding the Casserian ganglion in extracting a wisdom-tooth? Let him study his anatomy and see where the dentist would be obliged to go to sever the inferior maxillary nerve, or how he would reach the posterior dental in the upper jaw.—*Dental Practitioner and Advertiser*.

MECHANICS IN DENTISTRY.—In his paper on "Mechanics in Dentistry," Dr. Bonwill makes the following remarkable assertion:

"I think that it was an unfortunate procedure when Dr. was first placed as a title to our names. It is like a big solitaire diamond on the hands of a man who has to labor, whether in dentistry or the trades; he cannot keep his eyes away from it. Nor can he lose sight of the fact that his hand or finger must be placed so that every one else can see it. I appreciated it as much as any one when by certain laws of the colleges a diploma was given me, which I never looked at until the officer demanded it for registration."

The paper was read before the Odontological Society of Pennsylvania, and published in a late issue of this journal. There are valuable thoughts both in the address and in the discussion which followed its reading. But the author, we think, stood in a false position throughout; in fact, in his very first sentence he says that the subject (mechanics) is an unpalatable one,—that "there is no other word in dental language that is held to-day in such disrepute." This is surely a mistaken idea. We all recognize that mechanics is the basis of our work; but to fulfil in the most perfect manner many of the requirements of our profession, one must be more than artisan; he must be an artist, and must have a broad, liberal, professional education. In fact, dentistry seems to form a connecting-link between the professions, art, and mechanics, and in its highest development exemplifies each. The discussion of the paper is well worth re-reading.

INDICATIONS JUSTIFYING THE EXTRACTION OF TEETH.—In a recent number of the *Dental Office and Laboratory*, Dr. T. F. Chupein,

the editor, writes upon the extraction of teeth in preparing the mouth for an artificial denture. We cannot agree with the doctor in all of his remarks upon the subject. First he says, "Should a solitary central incisor or cuspid remain, these should be extracted before attempting to make the artificial substitutes." That, we think, would be the practice of the majority of dentists; but if the central incisor *and* the cuspid should be the only remaining teeth, would it not be equally good practice to extract them? or, if we find two or three of the incisors remaining, should they not be removed before making the artificial denture? A full denture would be more satisfactory, both as to comfort and appearance, than one made to fit around these teeth.

Again, the author says, "If one molar tooth be good on one side of the mouth, and its fellow on the opposite side be in a very dilapidated condition, every effort should be made to restore this tooth, going even to the extent of crowning the root rather than extract it; for, with two molar teeth by which the denture may be clasped, the substitutes will be of infinitely more service to the wearer; such a condition is applicable to both jaws." Now, there is no one who has a higher appreciation of the natural teeth than the writer; but should such a condition exist in his mouth, or that of one of his patients, he would consider it good practice to remove these teeth, feeling sure that better results could be secured by allowing the plate to extend well around the tuberosities in the superior jaw rather than clasp these teeth. It is impossible, of course, to formulate set rules for all cases, and at times difficult to decide just where to draw the line. Experience and judgment must be our guide in determining the practice to pursue.

Current News.

THE ELEVENTH INTERNATIONAL CONGRESS OF MEDICINE.

THE inauguration of the Eleventh International Congress of Medicine, to be held in Rome, September 24 to October 1, 1893, will take place the 24th of September, 1893, in the presence of His Majesty the King of Italy.

President, Professor G. Baccelli, Rome; Secretary General, Professor E. Maragliano, Genoa; Treasurer, Professor L. Pagliani, Rome.

The work of the Congress will begin in the nineteen Sections on the morning of the 25th of September. It will be continued in accordance with the arrangements to be made and published both for the general sessions and the Sections. Some of the general sessions will be devoted to scientific addresses delivered by scientists of all nations.

LIST OF THE SERIES.

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|---|---|
| 1. Anatomy. | 11. Otology. |
| 2. Physiology. | 12. Ophthalmology. |
| 3. General Pathology and
Pathological Anatomy. | 13. Odontology. |
| 4. Pharmacology. | 14. Military Medicine and Sur-
gery. |
| 5. Internal Medicine. | 15. Hygiene. |
| 6. Diseases of Children. | 16. Sanitary Engineering. |
| 7. Psychiatry, Neuropathol-
ogy, and Criminal An-
thropology. | 17. Dermatology and Syphili-
dology. |
| 8. Surgery and Orthopedy. | 18. Forensic Medicine. |
| 9. Obstetrics and Gynæcology. | 19. Hydrology and Clima-
tology. |
| 10. Laryngology. | |

REGULATIONS.

1. The Eleventh International Congress of Medicine will be inaugurated in Rome on the 24th of September, 1893, and will close on the 1st of October.

2. Any physician may become an active member of the Congress by fulfilling the conditions of membership, inscribing his name, and securing his admission ticket.

3. Scientists of other professions who, through their special studies, are interested in the labors of the Congress, may acquire the rights and assume the duties of active members, and participate in the work of the Congress, both by communications and discussions.

4. The fee for admission to the Congress is twenty-five francs, or five dollars.¹ It entitles to a copy of the Transactions of the Congress, which will be forwarded to the members immediately after publication.

¹ Money-order or check to the Treasurer, Professor Comm. L. Pagliani, Rome, Italy.

5. The character of the Congress is strictly and exclusively scientific.

6. The work of the Congress will be divided among nineteen Sections; every member is requested to indicate, on paying his admission-fee, the Section for which he desires to be inscribed.

7. The provisional committee will arrange the appointment, in the opening session, of the permanent officers. They will be a president, three vice-presidents, a number of honorary presidents, and secretaries. Each Section will elect, in its first meeting, its president and a certain number of honorary presidents, who shall alternately take the chair during the session. Some of the secretaries will be chosen from among the foreign members in order to facilitate the recording both of communications and of discussions in the different languages.

8. There will be daily sessions, either general or sectional. The times and numbers of the general sessions, and the business to be transacted in them, will be arranged by the President of the Congress.

9. The general sessions are reserved (*a*) for the consideration of the common work of the Congress and of its common interests; (*b*) for addresses and communications of general interest and importance.

10. The addresses in the general sessions, and in such extraordinary sessions as may be arranged, will be delivered by members chosen by the committee for the purpose.

11. Papers for and communications to the Congress must be announced on or before June 30, 1893. A brief abstract of every paper and communication, with their conclusions, must be sent to the committee on or before July 31. All of them will be printed and distributed to the members by authority of the President. Such as arrive after that date cannot be expected to find a place on the regular order of business, and will be accepted only if time will permit.

12. The business of the Sections will be arranged by their Presidents, who will also determine the hours of meeting, avoiding those reserved for the general sessions. Two or more Sections may hold joint meetings with the consent of their Presidents. There will be no vote on scientific questions.

13. Fifteen minutes are allowed for the reading of a paper or communication. In the discussion every speaker can have the floor but once, and for five minutes only. To close the discussion the author of the paper is allowed ten minutes. Additional time

may be given him by the President, by special resolution of the Section, if the importance of the subject under discussion appears to require it.

14. The manuscript of all addresses, papers, and communications read either before a general session or a Section must be handed to the Secretary before the close of the meeting. A special Committee on Publication, appointed by the President, will decide which or what part of them shall be published in the Transactions of the Congress. Such members as participated in the discussions are required to hand to the Secretaries their remarks in writing.

15. The official languages of the sessions are Italian, French, English, and German. The regulations, programmes, and daily bulletins will be published in the above four languages. During the meetings, however, a member may be permitted to use, for a brief remark, any other language, provided some member present express his willingness to translate such remarks into any of the official languages.

16. The President directs the discussions according to the parliamentary rules generally obeyed in similar assemblies.

17. Persons not classified under Article 3, who are interested in the labors of a special Section, may be admitted by the President of the Congress. They will receive a special ticket on paying their admission fee; will not be entitled to a copy of the Transactions; and cannot speak in the general sessions, nor in any Section other than that for which they were inscribed.

18. The President may invite or admit students of medicine to attend and to listen. They will be given a special admission ticket, free of charge.

GENERAL INFORMATION.

Journeys and Reduction of Fares.—The provisional committee has made arrangements with the different Italian and foreign railways and navigation companies, in pursuance whereof special reduced prices have been granted on the steamers and railways of this country and of the countries which the members of the Congress are to traverse.

In Italy the members of Congress will find tickets for round trips, starting from Rome; they will thereby be enabled to visit the most important cities and the various universities. In regard to this further notice will be given.

The Ladies of the Members will be furnished ladies' tickets, which will entitle them to the reduced fares granted to the mem-

bers, and to participate in the festivities connected with the Congress.

Festivities.—Besides the receptions which the kind and hospitable citizens of Rome will offer to the members, the Italian colleagues will endeavor to return, to the best of their power, the kindness they experienced during their stay abroad.

On some evening, yet to be decided, the members of the different Sections will join at a dinner which will be given in one of the first hotels of Rome.

The Italian physicians have formed special committees to show the most hearty and kindly hospitality towards the foreign colleagues.

International Exhibition of Medicine and Hygiene.—On the occasion of the Eleventh International Medical Congress an Exhibition of Medicine and Hygiene will be inaugurated in Rome, which will gather all that may practically interest physicians and specialists. A special committee has already insured the co-operation of all the most important manufacturers of the world.

Hotels.—All the first- and second-class hotels of the Italian capital will afford to the members, during their stay, all desirable comforts.

HARVARD ODONTOLOGICAL SOCIETY—ANNUAL MEETING.

THE Fifteenth Annual Meeting of the Harvard Odontological Society was held at Young's Hotel, Boston, Saturday, February 25, 1893, at 5.30 P.M., the President, Dr. Jere. E. Stanton, in the chair.

After the regular business had been transacted, the reports of the Recording Secretary, Treasurer, and Editor were read and accepted. Adjourning to the banquet-hall, forty-one members and invited guests did justice to the dinner set before them, and then gave their attention to the orator of the evening, Dr. Forrest G. Eddy, of Providence, R. I.

The subject of Dr. Eddy's paper was "Character in Professional Life," and he showed the advance dentistry had made during the past fifty years, and contrasted the dentist of the past, "who savored of the stable as well as the drugs of his office," with the truly professional man of to-day, whose recognized high standing was due chiefly to his character.

Dr. Dwight M. Clapp, as chairman of the Committee on the Harvard Dental School, reported that fifteen thousand dollars had

already been subscribed in addition to the three thousand dollars promised by the alumni. He felt confident that the desired amount would be obtained, although it would not be raised in a day.

Letters of regret had been received from Hon. John Q. A. Brackett, ex-governor of Massachusetts, Rev. Edward A. Horton, General Charles H. Taylor, and Mr. S. Albert Wetmore, who had expected to be present.

In introducing the speakers of the evening President Stanton said that at our other meetings we devoted ourselves to subjects connected with dentistry, but at our annual dinner we invited those who were outside of our ranks, so that we might keep in step with the world.

The members of the Society then had the pleasure of listening to Rev. Dr. Moxom, Carl W. Ernst, A.M., assistant postmaster; Stephen O'Meara, A.M., of the *Boston Journal*; Rev. Dr. Green, of Providence, R. I.; David Hunt, M.D., and Samuel M. Child, Esq., who not only entertained them with bright remarks and witty stories, but also offered many suggestions of the most practical value. The great truth was forcibly brought out that while every profession is working in its own individual line, each apparently separate from the other, yet when we get nearest to the great object for which we are all striving,—the great good of humanity,—we find we have risen to a common level where we can touch elbows.

After the guests had departed, Dr. J. C. Ottinger, representing the Union Electric Works, of Chicago, Illinois, exhibited "The Crowds Chemical Dental Outfit," which includes a battery, motor, drill, plugger, root-dryer, and incandescent mouth-lamp.

The Society then elected the following-named officers for the ensuing year:

President, Forrest G. Eddy, D.M.D., Providence, R. I.; Recording Secretary, Waldo E. Boardman, D.M.D., Boston; Corresponding Secretary, James Shepherd, D.M.D., Boston; Treasurer, Dwight M. Clapp, D.M.D., Boston; Editor, Henry L. Upham, D.M.D., Boston.

Executive Committee.—Waldo E. Boardman, D.M.D., Boston; Washburn E. Page, D.M.D., Boston; Jere. E. Stanton, M.D., D.M.D., Boston.

Consultation Committee.—Jere. E. Stanton, M.D., D.M.D., Boston; Dwight M. Clapp, D.M.D., Boston; Eugene H. Smith, D.M.D., Boston.

George F. Grant, D.M.D., Boston, was elected orator for 1894.

JAMES SHEPHERD,
Corresponding Secretary.

NORTH CAROLINA STATE DENTAL SOCIETY.

MEMBERS OF THE NORTH CAROLINA DENTAL SOCIETY:

Your Executive Committee met in Raleigh at the call of the Chairman, and made out the following schedule, which, we believe, will be an effective one, and we heartily trust that there will be an earnest co-operation of the members to make this the best meeting in the history of the Society.

The Executive Committee finds that the date of meeting will have to be changed to the fourth Tuesday (23d) in May, that we may not conflict with the Georgia Association, which meets second Tuesday.

STANDING COMMITTEES, 1893.

Dental Education.—J. E. Freeland, Statesville, N. C., Chairman.

Dental Chemistry and Metallurgy.—I. N. Carr, Tarborough, Chairman.

Dental Pathology.—J. H. Durham, Wilmington, Chairman.

Dental Therapeutics.—S. P. Hilliard, Rocky Mount, Chairman.

Operative Dentistry.—J. E. Matthews, Wilmington, Chairman.

Under this section the following special topics will be presented:

1. Should immediate root-filling be practised while purulent conditions exist at the apex? Dr. Matthews.

2. What are the best materials to enter into the composition of temporary fillings to be retained for a minimum of three years? Dr. Wyche.

3. What are the best methods of obtunding sensibility of the dentine, by either local or general means? Should arsenic ever be used? Dr. Wright.

Prosthetic Dentistry, including Crown- and Bridge-Work.—N. M. Culbreth, Whiteville, Chairman.

1. What are the best forms of partial lower dentures, and the methods of constructing the same? Dr. Culbreth.

2. Taking impressions. Dr. Hunter.

3. The Marshall anchor-plate and partial plates in general. Dr. London.

4. Crown- and bridge-work. Dr. Alexander.

Orthodontia.—J. F. Griffith, Salisbury, Chairman.

Oral Surgery.—W. H. Hoffman, Charlotte, Chairman.

Materials and Appliances.—J. W. Holt, Goldsborough, Chairman.

Dental Prophylaxis.—J. F. Ramsay, Asheville, Chairman.

F. S. HARRIS,

For the Executive Committee.

COMMENCEMENTS.

THE Commencement of the Pennsylvania College of Dental Surgery was held at the Academy of Music, Philadelphia, at 12 o'clock Tuesday, February 28, 1893.

The address to graduates was given by Professor Wilbur F. Litch.

Matriculates	197
Absent	2
Total	195
Graduates	23

The Commencement of the Philadelphia Dental Collage took place at the college amphitheatre Wednesday, March 8, 1893, at 8 P.M.

The address to graduates was made by Professor H. I. Dorr, M.D., D.D.S.

The number of students in each of the three classes is as follows:

Freshmen	129
Not in full attendance	7
Deceased	1
	—
	8
Total	121
Juniors	79
Not in full attendance	2
Deceased	1
	—
	3
Total	76
Graduates	25

The Kansas City Dental College Commencement was held at the Coates House, Friday evening, March 3, 1893.

The Faculty address was given by Professor Charles H. Lester.

Number of graduates	4
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THE International Dental Journal.

VOL. XIV.

MAY, 1893.

No. 5.

Original Communications.¹

INJURIES AND DISEASES OF THE MOUTH AND THEIR TREATMENT.²

BY DR. J. ADAMS BISHOP, NEW YORK.

MR. PRESIDENT AND GENTLEMEN OF THE ODONTOLOGICAL SOCIETY,—According to the monthly notice of your Executive Committee, I am to read this evening a paper on the “Injuries and Diseases of the Mouth and their Treatment.”

Such treatment is either surgical or non-surgical, or mechanical. Surgeons and dentists have to seek the assistance of one another to effect cures. Sometimes the dentist has to prepare the way for the surgeon's knife, and in other cases the dentist has to aid the surgeon by a mechanical support. Opportunities of this kind are constantly coming to our hands, and we should be thoroughly familiar with the methods of treatment proper in each case, or else we should turn the patient over to some one who is.

The cases I shall to-night speak of particularly have never, to my knowledge, been presented to a dental society nor put forth in a dental publication, but were so important that the surgeons in charge have reported them before the Academy of Medicine, the

¹ The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

² Read before the New York Odontological Society, February 21, 1893.

New York State Medical Society, and the National Medical Society, and these reports can be found in their publications and in the "Medical and Surgical History of the Rebellion," Part First. The casts are also to be found at the Anatomical Museum at Washington.

I will present first a case of partial reconstruction of the face, found in "Buck's Reparative Surgery," 1876. The patient was Carleton Burgan, aged twenty years, a volunteer in one of the Maryland regiments. His history, previous to his admission to the New York Hospital, was furnished by Robert F. Weir, M.D., assistant surgeon United States Army, in charge of the Army General Hospital at Frederick, Maryland (where Burgan had been a patient before coming to this city).

"He was taken sick June 5, 1862, with rheumatic pains, due to exposure to wet and cold. During the next month he was under treatment at the army hospital for typhoid fever, and in the middle of August, when his general condition appeared to be improving, gangrene set in, and, beginning with a small black slough, attended with fetor, on the gum at the foot of the first right upper bicuspid tooth, rapidly extended until it had involved and destroyed the right half of the upper lip, the adjacent portion of the cheek, and the ala of the nose, and denuded the entire superior maxillary bone. By the middle of October contraction of the healing parts had taken place to such a degree that the hole in the face was diminished nearly one-half in size. On the 23d of December, Burgan was discharged from the hospital in Frederick and from the United States service to go to New York."

On December 31, 1862, when admitted into the New York Hospital (as a patient in the hands of Dr. Gurdon S. Buck, surgeon to the New York Hospital and a member of the Academy of Medicine), his general health was good and continued so. The condition of his face was as follows:

"The right eye was destroyed and sunken; the right half of the upper lip, the right ala of the nose, and the adjacent portion of the cheek, besides the entire right superior maxillary bone, were gone, leaving an extensive opening directly into the cavity of the mouth and right nasal fossa. The margin of the opening, which was everywhere cicatrized, consisted below of the border of the lower lip which was prolonged on the right side, obliquely upwards and outwards, and adhered to the malar bone at a point where the superior maxilla had separated from it. From this point, which corresponds with the middle of the cheek, the margin of the opening extended upwards and inwards in a curved direction to the side of the nose,

approaching within a finger's breadth of the inner canthus of the eye, continuing thence along the ridge of the nose to its tip and a little to the right of the median line. The columna nasi being destroyed, the lower edge of the left ala and the rounded margin of the left half of the lip bounded the opening in this direction.

"The middle incisor of the left superior maxilla was wanting; with the exception of this and one molar, the teeth of that side were complete. The lining membrane of the cavity had everywhere a remarkably healthy aspect. The velum still retaining its bony support, performed its functions in deglutition undisturbed. The patient's speech, however, was very indistinct, and resembled that of a person with a bad cleft palate.

"In devising a plan for the restoration of this extensive destruction of parts, it was judged indispensable, as a prerequisite to any surgical operation, that an artificial substitute should be adapted to the cavity of the mouth, to supply the place of the right maxillary bone and afford a solid support to the soft parts that would be required to be transposed for the reconstruction of the mouth and the closure of the cheek and nostril.

"Dr. Thomas B. Gunning, an eminent dentist residing at No. 41 East Twenty-first Street, to whom the case was submitted, generously undertook the execution of this delicate and difficult work. The result, which he achieved after patient and persevering labor, displayed remarkable ingenuity and skill, and cannot fail to elicit universal admiration. The fixtures which he adapted were made of vulcanite, and consisted of two principal pieces. The upper piece being first introduced, occupied the nasal fossa and filled out the right half of the nose. It was hollow, and open in front and behind for the free passage of air. The lower piece formed an artificial palate, covering the entire bony portion of the roof of the mouth, and supplying the right half of the dental arch with the teeth belonging to it. Its left margin took support from the existing teeth of that side, some of which it embraced. The surfaces of both these pieces, where they come in contact with the walls of the nasal and buccal cavities, were channelled with furrowed lines to facilitate the flow of the secretions back into the fauces. Their accurate adjustment to each other and to the walls of the cavities which they occupied, permitted them to be worn without causing the least irritation. A third supplementary piece completed the arrangement. It capped the molar teeth of the lower jaw on the right side, and was connected with the opposite portion of the palate piece above by a spiral wire spring. The improvement of

the speech produced by these fixtures, as well as the increased facility of mastication afforded by them, were results highly gratifying to the patient and satisfactory to the surgeon. The material of which they were constructed was admirably adapted, by its light and indestructible nature, to its use. After the patient had worn them constantly for more than two weeks, to test and become habituated to them,—he himself removing and replacing them for the purpose of cleanliness with the greatest facility,—it was decided to perform the first operation on the 26th of March.

"This took place at the New York Hospital in the presence of a large number of physicians. Four operations followed, of rhinoplastic surgery, on April 23, June 18, August 8, and October 27, 1863.

"Within six days after the final operation the sutures were all removed, and the adhesion was perfect. A great improvement in appearance was thus accomplished."¹

I was present at all of the operations at the hospital, assisted in taking all the impressions, made all the rubber appliances and the casts exhibited here to-night. These appliances, though non-surgical, were of great assistance to the surgeon in giving back to this man the lost speech, mastication, and deglutition,—no small items when considered with his improved appearance. I visited him in Baltimore ten years after this transformation, and had the satisfaction of seeing the same plate in use that he wore when discharged from the hospital.²

Dr. Buck brought before a meeting of the Academy of Medicine, on February 7, 1866, the following case:

"Egbert Hewett was wounded, on the 19th of September, 1864, while under Sheridan, at Winchester, Va., by a fragment of shell, which came from the left and struck his mouth. The upper and lower front teeth were carried away, the right cheek was laid open from the mouth to the angle of the jaw, and the lower jaw was fractured at the symphysis. The teeth were replaced on plates in December, 1865; auto-plastic surgery completed the operation, and the patient was discharged January 19, 1866."

This case happened to come under my personal supervision, by my appointment to the staff of St. Luke's Hospital, through the courtesy of Dr. Buck.

¹ "Buck's Reparative Surgery," Appleton, 1876.

² Since reading this paper I have again had the satisfaction of seeing this man in Baltimore, and found him still using the same plate, and his face in a good, healthy condition. It proves what good blood he had, that he has outlived all the surgeons who watched these operations.—March 10, 1893.

FRACTURES AND THEIR TREATMENT.

In fractures or injuries presented to us, there are two things to be carefully and thoroughly considered: First, a correct diagnosis must be made to discover the extent and condition of the injury or fracture, in order to set the bones in their normal position, which is handy work for a skilful surgeon or an anatomist; Second, to see what mechanical appliances can be adopted to hold the parts steadily in juxtaposition, so that there may be a reunion by the process of nature, which always comes to our aid whenever and wherever she can.

It is no reflection upon the most skilful and distinguished surgeons to say that they ought, in many cases, to seek the aid of the dentist and his mechanisms to supplement their services in the interest of their patients; for he (the dentist) has experience in mechanical structures, which they (the surgeons) cannot be supposed to readily furnish.

In 1852 the Nelson Goodyear discovery of the process of vulcanizing caoutchouc came to the aid of dentistry. Its value to our profession cannot be over-estimated; and here we first had the opportunity to introduce perfectly interdental splints of vulcanite, which hold the parts so comfortably and firmly as to supersede all appliances of bandages, etc.; not only that, but it sometimes saves the patient from additional trouble, such as abscesses and exfoliations, which often in the past complicated cases treated by the old method of bandaging.

During a long association with the late Dr. Thomas B. Gunning, who was the first to use interdental splints (even before he was called in that historic case of Secretary Seward), I assisted in all his cases, both in private and hospital practice. The late Dr. Gunning is entitled to great respect for his skill and perseverance in whatever he undertook in dentistry, but his uncompromising attitude in the presence of such eminent surgeons as Surgeon-General Barnes and the medical directors of the army and navy was uncalled for. There was neither courtesy nor dignity in his consultation with them, during the treatment of Secretary Seward, in condemning the use of bandages which they used, and treating them as if they were incompetent practitioners or quacks. It was such conduct on the part of Dr. Gunning that deprived our profession of its proper credit, for, when they made their published reports, they studiously avoided all mention of him and his appliance, and no one could blame them.

CASE I.—“By an explosion on a Spanish man-of-war, while firing a salute in our harbor, in 1860, one of the men received the full force of the explosion, and was taken to the U.S.N. Hospital, Brooklyn, where Surgeons Franklin and Gihon were in charge. I have here the casts representing his injuries.¹ They consisted of a comminuted fracture of the lower jaw at the symphysis, the teeth of both jaws much shattered, with face severely burned and lacerated.

“The case had been carefully treated for over four months without producing any union, when, by the advice of Surgeon Bache, Director of the Naval Laboratory, Dr. Gunning was requested to treat it. The jaw was then contracting from loss of bone, and pieces were coming out through the chin. He applied a hard, vulcanized rubber splint, which inclosed the remaining teeth and gum of the lower jaw, its upper surface fitting well over the teeth above, except in front, where it was trimmed down to allow food to pass between the remnants of the superior incisors. The splint was fastened to the lower jaw by screws passing into a broken tooth on each side. The jaw was held up by starched muslin, moulded to a cast of the parts, in repeated folds, until a line in thickness. This reached to the zygomas, and was kept up by a band passing over the head. The splint was applied February 12, 1861. Fragments of the bone came away for some time after, but the splint was not removed during the treatment. The jaw united well by the middle of May, and the man was discharged.”

You can get but a faint idea from this report of the labor over this poor man; sick, tired out, with a fracture of the lower jaw of over four months' standing, every part of the face tender to the most gentle touch. And what was the condition on getting the mouth open for correct diagnosis? Anything but inviting. It was foul and slimy with pus, fetor, etc. Surgeons of the hospital had exhausted every method at their command. When Dr. Gunning was called into the case, with me as his assistant, the process of treatment was commenced inside the mouth. It took much time to manipulate the parts of the mouth, to open it sufficiently for cleansing, and then to take the impressions. The external bandages were of no use to us, but, as we could use vulcanite, we soon saw that we could make a cap of it which would help greatly when fastened. We were ten days, trying with many devices, before we thought of using screws to hold it. When they were made and inserted we felt that something had been accomplished; and,

¹ New York Academy of Medicine, October, 1863, and *Dental Cosmos*, 1863.

as we watched it from day to day, we found they did not fail us, and we saw a most wonderful improvement going on. He was sent home with this splint in his mouth. This is the first interdental splint ever made of vulcanite, and it opened up a new treatment for the lower jaw.

The medical men of the Navy Hospital and Laboratory were the first to appreciate its benefit, and, as an outgrowth of the case, Dr. Gunning was called to Washington by Surgeon Bache of the Hospital.

CASE II.—“Dr. Gunning himself received a compound fracture in his own jaw between the right canine and lateral incisor teeth, on November 4, 1862, through his horse falling under him. The bone was much displaced, and two incisor teeth loosened. He set the bone, and it was held by strong, well-stretched silk, inclosing three incisors, the right canine, and the first bicuspid. This immediately stopped the bleeding and held the bone firmly. A vulcanite splint was applied thirteen hours after the injury. It inclosed all the lower teeth, and was fastened by gold screws to the first molars. It held the fragments so well that he was able to attend patients in the afternoon, and continued so to do subsequently. The gum united by first intention, and the pain and swelling, which were very great in the external parts, diminished rapidly. On November 28 the splint was removed, and good but flexible union found. It was again fastened on, but, after seven days, was worn without the screws, and removed daily. The jaw grew strong, the teeth firm, and the splint was left off January 1, 1863, but worn at night until February 1. The jaw was used in eating, talking, etc., throughout the treatment.”

The case was presented to the New York Academy of Medicine, January 7, 1863, by Dr. A. L. Sands. He refers to a conversation had with Dr. Gunning, in which the latter outlined his plan for securing a broken jaw, and says he had promised, in case of meeting with such an injury, to try it, and comments on Dr. Gunning being one of the first to receive the benefit of his own ingenuity.

In the discussion that followed the reading of the paper, Dr. Alex. N. Stephens, Professor Emeritus of Clinical Surgery in the College of Physicians and Surgeons, said,—

“I look upon this splint as far beyond anything in the way of treating fractures of the lower jaw that has ever been discovered, and I congratulate the Academy on this discovery, for I fully believe it to be of such importance that it will last forever.”

The splint was shown the Medical Society of the State of New York in February, 1863.

I wish to present to you a few additional facts about this case of Dr. Gunning's.

When he came into his house, he said, "I have broken my jaw." "It can't be so," I said to him. He took hold of each side of his fracture and pulled it apart so that I could pass my finger through it.

Dr. Sands was sent for, also Dr. Hosuck, who lived very near. Dr. Hosuck cared for his face and prescribed for him rest and quiet, and said in a few days he would care for the bone. Dr. Gunning thanked him and said he would be glad to see him, but would treat his fracture himself. He then said to me, "Whom can you get to help you to make my splint, so that it can be placed on the jaw to-morrow morning?" I availed myself of the kind services of Dr. — (by request, his name is omitted). He took the impression about eight P.M., remaining all night to help make the splint, and we were able the next morning at nine to place it in the mouth. It was a very strange coincidence that Dr. Gunning should receive such a fracture, eighteen months after the Navy Hospital case, to enable him to receive and prove his own medicine or method. It proves the great value of this treatment of a fracture that he never lost an hour from his office. How different it would have been had it been treated under the old method of bandaging! This was the second interdental splint of vulcanite ever used.

CASE III.—"G. B., aged forty-five years. His jaw was fractured by a blow through the socket of the right second bicuspid, June 5, 1863. There was a displacement of the back fragment inward and forward. The patient could not lie down, but slept in a chair holding the jaw, as the surgeons could not keep the fragments in place. The fracture commenced inside the first bicuspid tooth, and passed backward and outward through the socket of the second, and downward also at the expense of the back fragment. As the loosened bicuspid had been extracted, instead of being kept in place, there was nothing to prevent the back fragment from sliding inwards and over the front one and impinging on the inferior dental nerve. The splint was worn until September 3. The jaw was allowed its natural motions throughout the treatment."

This splint was presented to the New York Academy of Medicine in October, 1863. Dr. Gunning received the thanks of the Academy, accompanied by a request to report further when he should have completed the splint which he considered best adapted for general use.

This case (No. 3) was a very difficult one. Mr. B. lived on Washington Square, north. He received the fracture at ten p.m., while out for a stroll on the square, nearly opposite his house, by being hit with a slung-shot. His physician (a member of the Academy of Medicine at the time Dr. Sands reported this interdental splint, five months before), and two other physicians were called in, and yet the only thing they did for the patient was to apply external bandages and tell him he would have to sit in his chair and keep his mouth as still as he could until nature had affected a union.

These physicians had entirely forgotten, if they had ever heard of, Dr. Sands's paper and Dr. Stephens's remarks upon it; and it was left for a lady friend of Mrs. B. to tell her of Dr. Gunning and his method, and the experience he had had with his own mouth.

This fracture being at the inferior dental nerve, every movement, however slight, would cause him great pain, and his sleep was greatly disturbed even while in a sitting posture, for the moment sleep came the hold of the muscles was relaxed, and, the jaw falling, he would be awakened instantly by the pain. Some days passed before the splint was fastened to his mouth, but this so controlled the muscles that on returning home he lay down on his bed and had his first good sleep for ten days.

This is my experience with this patient, whom I saw every day.

CASE IV.—"J. Q., twenty-five years of age, had his jaw broken by being thrown from a cart on December 29, 1863. On the same day he called in a physician, who tied the teeth together and sewed up a deep gash over the left masseter muscle. The ligature did not permanently control the fracture; the teeth became very loose and the front of the jaw was drawn back inside of the left fragment. Patient went into the Bellevue Hospital on January 9, 1864. The left lateral incisor, loosened by the accident, having been extracted, attempts were made to hold the jaw in place by passing wire around the teeth, but without success. On January 14 the patient was brought to Dr. Gunning's office. He found the jaw fractured through the socket of the left lateral incisor, slanting towards the symphysis as it descends. The gum was red and painful; there was great tenderness under the jaw and upon the ramus, which was also supposed to be fractured. On January 15 he applied a vulcanite splint without screws or any fastening. It held the fragments in place, and the patient experienced great relief. On February 13 he took off the splint temporarily; no displacement followed, but the union was very soft. After this he removed the splint and examined the parts weekly. On March 9 the wound was healed.

On April 9 the union was strong, but it was deemed advisable to wear the splint longer on account of the canine tooth which was not yet firm. The jaw articulated with the upper, and the upper and lower teeth fitted against each other well. On May 1 the splint was dispensed with."

CASE V.—"Mary Ann D., twenty-nine years of age, was found in a state of insensibility February 12, 1864, and sent to the Bellevue Hospital the next morning. She remained unconscious until the 16th. On February 17 Dr. R. B. Brownell spoke to Dr. Gunning of her broken jaw, but said nothing could be done to it at present, as her head and face were so terribly swollen. On February 21 Dr. Gunning saw the patient at the hospital, and found her lower jaw broken on the right side, commencing half an inch back of the canine tooth and passing downward at the expense of the back fragment. There had been no teeth back of the canine for some time, and, the gum being torn, the back fragment rode over the front, with its point sticking out sharp and bare for three-eighths of an inch in the direction of the symphysis. On February 22 the patient was taken to Dr. Gunning's office. The swellings on the face had lessened somewhat, but were still undiminished in the gum around the fracture. On the left side there were no teeth back of the bicuspid, and the gum was sound and healthy, but indented by the upper wisdom tooth which had been pressing into it since the accident, previous to which it had not done so. This condition of the parts induced him to examine the left ramus carefully, and he found great play of its upper back portion, especially inward; but the only displacement, when at rest, was upward and forward, and this to no great extent, as it was checked by the upper wisdom tooth. He finally concluded that a fracture existed in the neck of the condyle, passing downward and backward, thus allowing the muscles to draw the bone upward and forward. The lower jaw contained only the four front teeth, the two canines, and the first left bicuspid; the gum back of these was free from roots, except that of the right wisdom tooth, which still remained, but was decayed close down. The upper jaw had been without the eight teeth forward of the second bicuspids for some time; of the other eight, seven still remained, the right second molar only having been extracted. To set the jaw the right fragment was put in the best position that could be obtained with the fingers, assisted by a stout piece of silk passing round the left canine. A jack-screw with a collar fitting against the root of the wisdom tooth in right fragment, and the other end bearing on the gum between the left lat-

eral incisor and canine teeth, was then screwed out until the extension was sufficient to allow the fractured bone to come into proper position. The end of the long or forward fragment was then held up, and an impression in soft wax taken of all the teeth and gum as far back as the ramus on each side. Care was taken to put the bone in place at the neck of the condyle, while the bite was obtained. On February 28 he applied the splint. On March 2 the patient brought a request from the surgeon in charge of her case at the hospital that Dr. Gunning would screw the splint fast to the teeth. The gum had grown over the point of the bone; it was now, therefore, only a simple fracture. He screwed the splint fast. On March 14 the patient was in good spirits and quite comfortable. She wanted to leave the hospital and go to work. She made no complaint as to the teeth. On March 26, at Dr. Gunning's request, the patient was discharged from the hospital, but still wearing her splint. On April 8 the splint was removed and a good union found. The splint was worn just forty days, but the patient had a good constitution, and the bone united rapidly. On June 7, 1865, the patient sent word to Dr. Gunning that the jaw was all right."

Cases IV. and V., as here reported, were treated in Bellevue Hospital on December 29, 1863, and February 12, 1864, respectively. I have no comments to make on these, as they are fully reported.

CASE VI.—Wm. H. Seward, President Lincoln's Secretary of State, sustained a fracture of the lower jaw, as we all know. The injury was caused by falling from a carriage April 4, 1865. Unsuccessful attempts had been made to hold the jaw in place by bandages, and also with ligatures on the teeth, by the surgeons first called to the case. On the 14th, the date of that awful tragedy in Washington, when Lincoln was killed, the assassin Payne forced himself past Mr. Seward's son, nearly killing him at the door defending his father, and succeeded in reaching the bedside of the sick Secretary, and inflicted a severe cut about the jaw and throat, which was intended to end his life then and there.

I can well recall the circumstances of this sad day to our nation, and the gloom resting over the city of Washington when I arrived there, having been requested to accompany and assist Dr. Gunning in his efforts to bind up Seward's broken jaw.

Lincoln's dead body lay in state, and all our distinguished men were watching the course of events with great anxiety.

Dr. Gunning had been called before the tragedy took place, but did not get there until after it happened. We visited and

treated Mr. Seward in the same room where Mr. Blaine so recently ended his earthly days, making it our dental laboratory.

I will read from Dr. Gunning's report of the case. "The cut inflicted reached from under the right zygoma to the left of the trachea. Steno's duct was severed, and the right fracture laid open externally, the bone being also much exposed in the mouth from the original injury. No arteries had been ligatured. The wound was neatly sewed up, and was healing by first intention, except immediately under the fracture. The swelling and stiffness made the examination difficult, but the ramus proved to be uninjured. There was, however, a second fracture, but on the other side of the mouth, the jaw being fractured on both sides between the bicuspid. The lower jaw contained all the ten forward teeth. The right wisdom tooth and root of the left were all that remained back of the bicuspid. The part in front, containing eight teeth, was drawn down out of place, while the right back fragment, with the wisdom tooth and second bicuspid, was drawn up, showing its fractured end white and bare. Pus discharged profusely from both fractures. The gum was pale and flaccid, in keeping with the general condition of the patient. The upper jaw was entirely without teeth. We deemed it important to set the exposed bone in place as early as possible, and also to give the patient time to recuperate, as he had already been subjected during the morning, not only to a relation of the President's death, but to much that was said and written upon the subject. In the afternoon, while explaining the treatment proper for the case to Dr. Whelan, Dr. Gunning stated his unwillingness to commence, except with the understanding that he should control it entirely.

"*April 29.*—He set the jaw, and held it in place by wire and silk ligatures, took a wax impression of the teeth and gum, and obtained the bite directly from the teeth, etc. Although the front of the jaw containing the eight forward teeth was greatly displaced (before the setting), the silk and wire ligatures held well until May 2, when they were removed and the splint applied. It was of hard, vulcanized rubber, covered the roof of the mouth and adjacent gum, inclosed all the lower teeth, and went down over the gum on the outside somewhat. This splint held the jaw firm for sixty-eight days, when it was removed. There was good union on the left side, but the right fracture was still ununited. For this, however, Dr. Gunning was prepared, as the bone had been exposed so much during the twenty-four days which had elapsed before he set it; and the saliva from the right parotid gland had discharged

through the fracture. This was one of the worst features of the case."

Let me only add a word to this.

This case to-day in my hands could be treated without this external arrangement. I should use the simple splint of black rubber, like one I have placed before you, for I feel sure that the artificial denture would act as kindly as the natural teeth.

I have searched all the medical and dental works in vain for any description, either modern or ancient, of any invention prior to these dates, of splints, made of vulcanite, as applied to fractured jaws. It is my privilege to put this on record, as having been personally in charge of the above cases, under Dr. Gunning; and I know what I say when I speak of priority of invention of interdental splints of vulcanite.

In a communication of Dr. T. B. Gunning to the late Professor Agnew, of Philadelphia, wherein he claimed the great superiority of his interdental splints over all other appliances, as doing away with all external bandages, except in the case of an edentulous condition, he remarked that no case without teeth was on record prior to the one reported in May, 1879, in Johnston's "Dental Miscellany," vol. vii., page 63. The case referred to was in my hands for treatment, and, as it was one with many difficulties, treated successfully with poor facilities at command, I will venture to repeat part of the report to you to-night.

"I was called in consultation by Dr. Phinny, of Norwich, Conn., in the case of Asa Bailey, aged seventy years. While recovering from a severe attack of pneumonia he had tried to go down-stairs, but, owing to his feeble condition, fell, and received a compound fracture of the lower jaw, the bone protruding through the gum. His last tooth, a canine on the right side, was knocked out and lost. The fracture was ten days old, with considerable displacement. Dr. Phinny had reduced it with much care and skill, but could not, with bandages, keep the parts in position. There being an entire absence of teeth in the mouth, my first difficulty was to secure the fragments in position. I had never met with such a case. I was without cups or proper conveniences for taking the impressions, and in the country where no dental office was near. Having, however, a little plaster, with a pair of shears and plyers, I made cups for upper and lower jaw out of a tin milk-pan, and succeeded in getting good impressions, from which I made the splint at my office in New York. I did not see the patient again till six days after; but with a little trouble the fractured jaw was placed in the splint. The value of

this splint could not be better demonstrated than by the confidence which the patient expressed when it was adjusted. He at once felt that his jaw was secured from the displacing action of the muscles. He could breathe better and swallow with greater ease. I have found this so with all patients under this mode of treatment. I saw the patient again in three weeks, and, on removing the splint, found the fracture well united for so short a time. The patient was then feeling so encouraged that he wished to improve his time by going to work, and before my next visit, three weeks after, he was out following his plough, and doing heavy work with little inconvenience.

"I removed the splint in just six weeks from the day it was first applied. The union was then strong; and it was well ossified in November."

M. Malgaigne, in 1847, says that no case of fractured lower jaw destitute of teeth seems to have been presented for treatment. Such a case seems never to have presented itself to Dr. Gunning in more than forty years' experience.

Books, in great number, have been written on fractures and their treatment, by many of the most learned surgeons of the world,—by Drs. J. F. Malgaigne, Lonsdale, Boyer, Cloquet, Stimson, and William Gibson, who, in 1827, occupied the chair of surgery in the University of Pennsylvania.

The late Frank H. Hamilton, M.D., of this city, in his "Treatise on Fractures and Dislocations," published in Philadelphia in 1863, devotes twenty-two pages to the fracture of the lower jaw; and yet, in all these writings, no mention whatever is made of the interdental splint, until in the 1884 edition he devotes thirty pages to it, and refers particularly to Kingsley's.

Bean, a surgeon in the Confederate service, reported through the *Richmond Medical Journal* that he had over forty cases in the army hospitals. It seems a large number, when we consider how rare the cases are.

Dexter's "Centennial Historical Account of American Dentistry," published in 1876, failed to make any mention of the interdental splints. And yet Dr. Gunning made an exhibit in the Centennial Exposition of the interdental splints for the treatment of fractures of the jaws, including that used in Secretary Seward's case. And in the "Reports and Awards," Group XXIV., edited by Francis A. Walker, chief of the Bureau of Awards, page 25, he says, "He (Dr. Gunning) claims, and I believe justly, that it was the first splint ever used without an appliance outside the mouth." In

this same publication fifteen pages are devoted to artificial legs, six pages to trusses, six pages to surgical instruments, three pages to splints, and nineteen pages to dentistry, of which six pages are devoted exclusively to Dr. Gunning and his hard-rubber appliances for fractured jaws and the cleft palate; of such importance did this matter seem to these judges, all of whom were either physicians or surgeons.

One other matter I wish to mention is the use of jaw-cups in which to take impressions, from which to make the interdental splints. They are of particular value to country practitioners, and are very easy to become familiar with. Dr. Gunning's idea was to use gutta-percha in the same cup, after getting the cast, and thus make a splint of it; but I prefer to use vulcanite splints, perforated so that, when they are in place, the tongue and muscles of the cheek are constantly forcing fluids through, and, with a brush, they can be kept very clean.

The important results that surgery and dentistry can accomplish, when worked together in the interest of an unfortunate human being, are well illustrated by the case of Josiah Dutcher, who was under the treatment of Dr. H. B. Sands in 1873, and whose case was reported that year by the New York County Medical Society. I have here the casts made in the Dutcher case and his photograph, which makes him a presentable and even good-looking man after he had been reduced fearfully by the surgeon's knife and the parts restored artificially by the dentist. This was a case of naso-pharyngeal polypi, wherein the surgeon successfully encountered many difficulties by an operation through the mouth, and made extensive removal of parts attended by serious risk of hemorrhage into the glottis.

The time this evening is entirely too short for me to refer in this paper to cases of cleft palates. But I wish to speak of a case of cancerous tumor, as it involved so much where the dentist supplemented the surgeon, supplying lost parts by the use of vulcanite. Of the many cases I have had to treat, I recall one where the gratitude of the patient was expressed to me by letter, within a day or two after the mechanism was placed in his mouth. The late Dr. H. B. Sands had removed a cancerous tumor for the Rev. J. E. Rockwell, of Staten Island, the removal involving one-half of the upper jaw with the hard and soft palate from the median line on the right side. This left him without the power of articulation. The dentures had to be most carefully fitted, and balanced with spiral-springs, he having no natural teeth left; and the upper

denture had to do a twofold work, having an obturator attached to it. The patient was so well satisfied that he wrote me he considered he had a new lease of life. He said his voice was good; in fact, he had just performed a marriage service.

These seven cases of fracture which I have reported, and of which I have shown you the splints, have all been discharged, as cured, in less than four months, with little interruption from everyday business.

I do not suppose you will have in your office to-morrow a simple, compound, double, or edentulous fracture; they are very rare, as is well shown by the report of one of our largest hospitals for the year ending September 30, 1891. This report shows a total number of two thousand six hundred and thirty-four cases, both medical and surgical; of these, seven were treated for fracture of the lower maxilla and three of the superior maxilla.

In a conversation had within ten days with a surgeon of another large hospital, he stated that he did not believe he had ever had a case of fracture of the lower jaw in his private practice, and had only treated two in hospital practice, in both of which he had used bandages. This will suffice to show the comparative rarity of these cases, and yet we ought certainly to be well prepared to adopt the latest and most approved treatment, when such cases are presented to us.

At times our profession has tried to make a most worthy showing of progress. But, as I said before, the "History of Dental and Oral Science," coming down to 1876, failed to notice this important treatment in dental surgery, and yet it had been in use thirteen years.

The text-books for our dental colleges are faulty, and hence the teaching must be. The great hospitals of this city are treating in the old way with external appliances, as I have myself seen, with regret.

In the Congress which met in London in 1881 there was nothing which helped the dental profession very much, or that would attract the older surgeons to our specialty; and the three other triennial Congresses, which have since met, were not, as far as I know, of any account in improving the method of treating fractures of the maxilla bones, if judged by their published proceedings, which I have looked over carefully.

We are now fast approaching the World's Columbian Dental Congress, where the dental profession will be together in a representative body. At this Congress it is expected that papers and

reports of great interest and value will be presented in such numbers and volume as to make books for future dental history.

It is not for me to say that the subject-matter of this paper is worthy a place in, and the consideration of, the Columbian Congress. But I do say that these inventions and devices are equal to any exigencies in the treatment of fractures which can come before us; and some of them have the additional value of being the original inventions used several years before any other splints of vulcanite came into notice. Therefore I suggest that our dental publications shall place them on record. Because they are important in history, as well as practical for present use, they deserve to be on exhibition, and ought not to be crowded out by less important splints which some members of our profession may desire to show with their alleged improvements.

Whoever, in this advanced stage of dental surgery, has to resort to external bandages is not doing for the patient that which tends to his most speedy recovery. But it is he who can so harness the great net-work of muscles which nature has so magnificently formed around the bone as to make them serve in the treatment, which they can do because they pull and draw so kindly and gently over the wounded parts as, by their natural action, to bring the bone into closer unity, thus keeping the bones in place until nature completes the work; he that can do this, I say, is doing a twofold duty by his patient. For he not only repairs the fracture, but he secures a rapid recuperation of his patient by making it convenient to take substantial and nourishing food for the body which is called upon to build up the new bone for the cure.

THE USES OF HYPNOTISM IN MEDICINE.¹

BY HAMILTON OSGOOD, M.D., BOSTON, MASS.

I HAVE been asked to speak on "The Uses of Hypnotism in Medicine." If I had read the proof of the card of invitation, I should have substituted for the word "hypnotism" the words "hypnotic suggestion," or perhaps the word "suggestion" alone.

There is a good deal of curious misinformation afloat in regard

¹ A smoke-talk (extempore) before the Harvard Odontological Society, October 27, 1892.

to hypnotism. In the first place, in effecting cures hypnotism plays a very secondary part. Suggestion is the main influence and wholly dominates hypnotism. Charcot, who has been a prominent investigator of this subject, does not agree with this; but although he has done much to bring this matter before the scientific public, he is very full of failures, and his theories have been exploded by scientific men throughout the world; and Bernheim and Delbœuf, members of the Psychological Congress in London, at which I was present in July last, went so far as to assert that there is no such thing as hypnotism,—but only suggestibility.

You can hardly get a fair idea of this subject without learning something of its history and growth; but I will first say that, having explained my meaning with regard to the word hypnotism, I shall continue to use that word this evening because it is in common use.

Auto-hypnotism, or self-hypnotism, was used by the Magi of Persia and the Jogi of India twenty-five hundred years ago. These men threw themselves into trances by fixing the eyes intently on the end of the nose. The powers of the magnet have also been known and valued from the days of antiquity. Then we come down to the middle of the sixteenth century, when animal magnetism was first mentioned. Paracelsus was the first man to write on this subject, and his theories were studied very thoroughly by Mesmer, who, in 1779, came out in a useless book in which he announced a new treatment which he called “animal magnetism,” but because of Mesmer’s great success the name of the treatment was very quickly changed to “mesmerism,” and if you wish to read about the influence of the *baquets* which Mesmer constructed, and about the tanks of water, the chains, and other things which he magnetized, in order to treat many people at once, you can find an account of the matter in Dumas’s “The Queen’s Necklace.”

Mesmer believed that in certain gifted individuals there resided a fluid analogous to that found in the magnet, and that this fluid could be propagated upon other individuals by the operator at will; and in that way he suggested his cures. He had a large following, and made a great deal of money, and the attention which his treatment attracted led the French Academy to inquire into the subject; but it was abandoned by this body as not being proved and not being useful. Fix in your minds, then, that hypnotism or mesmerism is the same thing as animal magnetism. Animal magnetism is what Mesmer used, or what he taught, but simply because he was the first to practise it it was called “mesmerism.”

After Mesmer, the Marquis de Puységur also treated the sick by the use of magnetism, and had so large a following that he could not attend to his patients. He therefore magnetized a large tree in front of his house and also glass rods and bowls of water, and his patients went to these various things and got their cures.

Then there is a gap, and for a number of years the matter was left principally in the hands of charlatans, with occasional interest on the part of scientific men. In 1814 a Portuguese, born in India, the Abbe Faria, gave exhibitions of magnetism in France and in England. He was the first to assert that whatever the effect might be, it did not proceed from the operator, but took place in the mind and body of the subject. Mr. Braid, a surgeon of Manchester, England, in regular standing, attended Faria's exhibitions. He became interested; he began to think the matter over, and finally took it up himself, and in his book gives a record of sixty-eight cases which were successfully treated. He also asserted that the whole thing depended upon the patient,—that if the patient's mind did not respond, no effect followed. The method he employed was to have the patient look at some bright object, usually his lancet-case. This intense fixation of the eyes frequently produced sleep. Charcot strikes a gong or flashes a bright light, and his patients, who are always hysterical or hysterio-epileptics, are instantly put to sleep. These methods, such as the use of a sudden light, striking a gong, or fixing the eyes intently upon a very bright object, produce sleep; but it is a pathological sleep produced artificially by these methods, which are more or less injurious. The school of Nancy uses simply suggestion, which I will explain a little later.

Braid's influence led many scientific men, notably students of psychology in England, to study the subject, and about that time a man by the name of Grimes introduced the matter into this country under the name of electro-biology, and he had rather a large clientele. It was first applied to dentistry by a Boston man. I have never been able to learn his name, but I found the fact recorded somewhere, and used it in my first paper on the subject, some three years ago, after reading which a man called on me and, if I remember rightly, told me he was the dentist in question, but I was busy just then, and did not have time to listen to what he had to say.

After Braid there followed another hiatus, until we come to the year 1866, when Liébeault published a book on "*Suggestive Therapeutics.*" That book was the result of years of practice, and he was the first man to use suggestion exclusively,—that is, he was the first man to talk to his patients. He was called erratic and the

book was shelved. In 1878 Charcot began his experiments; but we can dismiss Charcot by saying simply that his theories are full of error, while yet admitting that he has done a great deal to put the subject on a scientific ground. In his writings he says that he thinks suggestion useless.

In 1882, Professor Bernheim, of Nancy, who is the head of the medical school in that city, was asked to go and see Liébeault, to whom I have referred. Bernheim at that time was a thorough sceptic in regard to this subject. He said it was all nonsense, and that he would not waste time going to see Liébeault's work. A friend of his finally almost dragged Bernheim into one of Liébeault's clinics, and what he then saw so astounded him that he immediately began to investigate the matter by applying the treatment to his hospital patients, and two years later published a book entitled "Suggestion," which, by the way, is one of the best books written upon this subject, and can be obtained in this country in translation. Then Beaunis, another professor in the same city, took up the physiological bearings of suggestion, he published a book, and so the thing steadily grew, until to-day the literature of the subject is very large; there are two journals regularly published in the interests of hypnotism; there is a hypnological society, which meets every month in Paris; and I had the pleasure of attending one of its meetings in July last.

As a tribute to his memory, I will remind you that Liébeault, whose book was derided in 1866, is now considered the father of the modern school of hypnotic suggestion. He practised the treatment nearly thirty years, almost without remuneration, his patients being poor in possessions, but amounting to many thousands in number. The actual head of the school to-day is the brilliant Bernheim, of Nancy. Wetterstrand, of Stockholm, Forel, of Zürich, Moll, of Germany, Van Eeden, of Holland, Bérillon, of Paris, Lloyd Tuckey, of London, are well-known hypnotizers. They have all published books on the subject, these books being but a few of the large number now in print, and written by medical men of various countries.

With reference to the history of hypnotism, I think I have mentioned all that one needs to know; but I wish to impress upon your minds that animal magnetism is dead; there is no such thing as the passage of fluid from one person to another,—that theory is all gone.

Hypnotism can be very wrongly used, and it is very much misunderstood. In comparison with the proper means of putting a

person to sleep, hypnotism is not only unnecessary but it is objectionable. In hypnotizing a person some artificial method is used; for instance, a bright object is held before the eyes, the subject is required to fix his gaze upon it, and the muscles of the eyes being intimately connected with the brain, soon become tired. You can see, then, how, particularly in a very sensitive person, trouble would be apt to arise in the nervous system, so that often patients have been thrown into hysterical convulsions by the use of such methods, and these instances are cited by some medical men to prove that the whole system is dangerous. In one case, at an evening party, some people proposed hypnotism as an amusement. A diamond ring was held before the eyes of a young man for fifteen minutes and he finally became hypnotized, but he felt the effects of it for about three months, simply because nobody knew how to bring him out of it. That is enough to prove that to use this treatment upon anybody for amusement is wrong. I never use it for any purpose whatever except to relieve pain, to impart vigor, or to overcome a bad habit, such as intemperance or the cocaine habit. The possibility of being able to cause hallucination is a great temptation. You have a man asleep and his condition is such that he will do exactly as you direct, and it would create considerable amusement to by-standers to make him think himself an alligator, or a soldier, or a priest, or what not; but all that is not only wrong, it is wicked, it is an unjustified interference with the personal liberty of the subject. The use of suggestion should be confined strictly to alleviation of distress or stimulation of the functions of the organism of the patient.

I regret that more of our medical men are not interested in the application of this method of treatment. There are various reasons for their lukewarmness and prejudice. In the first place, it is a new thing for physicians thus to treat their patients. Secondly, the method has long been in the hands of charlatans, and for this reason it requires courage to use it in practice. Again, there is, here and there, a physician of influence who pronounces the treatment dangerous. Let me say, however, that whenever a medical man makes this statement you may be certain he is unfamiliar with the method. He may have read about it, and he may have read largely, but he also may have read for years upon four-in-hand driving, or upon navigation, but this does not make him either a good whip or a good sailor. Practical familiarity with the uses and application of hypnotic suggestion is the only title one can possess to an opinion upon it. But if a physician of influence pronounces it danger-

ous, the lesser lights, like sheep following a leader, jump the same wall, and therefore let the treatment alone. Dangerous! Why, morphia, strychnia, ether, are a score of times more dangerous, and we are never quite sure how they are going to act. Whereas, hypnotic suggestion applied by the verbal method is absolutely harmless, beneficent, and helpful. But I wish we might have a law forbidding all public exhibitions of "animal magnetism," so-called, because they have done a great deal of harm. The exhibitor does not see his subjects again, and does not know what the effect has been on those persons. The whole thing is wrong and an outrage, and in the track of those people who give public exhibitions there is always found more or less nervous trouble, the result of overtaxing subjects and the want of proper care.

The fact is, hypnotism should be kept wholly in the hands of medical and scientific men. In five European countries these outrageous exhibitions are forbidden by law. In this country the city of Philadelphia is the only place in which they are not allowed.

Now, I think we are ready to take up the matter itself. A person comes for relief, and he is to be relieved by suggestion. He is not put to sleep by any waving of hands or so-called mesmeric passes. The influence used is simply suggestion underneath and throughout the whole proceeding. If passes are made over a patient, and he thinks they are going to make him sleep, he will sleep; but passes are unnecessary and smack of charlatanism. No person can be put to sleep unless he knows he is going to be put to sleep and is willing; and if the physician properly addresses a patient who is perfectly willing, that patient, if he be suggestible, will receive the suggestion and sleep, and the passes are entirely unnecessary. Just now occurs to me one of the objections raised by the laity,—viz., "I would not give up my will to anybody." Now, we will say that a man has chronic trouble and has to be treated a number of times. He comes to me and receives his treatment just as if I were treating him locally for some affection of the throat. As I am doing what he wishes me to do, he does not give up his will to me, but I am serving him and rather giving up my will to him.

The patient falls into a pleasant and what appears to be a natural sleep. Then the suggestions are made. If the patient is suffering in any particular part, it is my habit to stroke that locality gently with my hand while I make verbal suggestions. This procedure seems to call nervous energy to that part by attracting the patient's mind to it. The patient is asleep, but he hears every-

thing I say to him; he may snore, and yet the auditory nerve conveys to his mind every suggestion I may make; and if I say, "You may awake now," he will awake at once. The patient has done as I wished, his mind has received what I have said, though he may not remember a word of it after waking, and he finds he is relieved. On the other hand, the patient may be largely conscious during his somnolence, and still he can be relieved by suggestion. How does that occur? I will tell you. The upper part of the patient's brain is asleep; it is asleep enough to have lost its intellectual initiative. The patient of himself cannot initiate an idea, but still possesses what may be called sub-consciousness. This is what Holmes calls "the other fellow." It is our automatic self. It is that state of mind which impels you to step over a hole in the sidewalk, or get out of the way of a team or horse-car when crossing the street, even though you are mentally unconscious of these objects and very much interested in the conversation of your friend as you walk along. But if your friend afterward ask you, "Do you remember that hole in the sidewalk which we passed a few moments ago?" You will say, "What hole? I don't remember any hole; where was it?" "It was on Boylston Street, opposite Arlington. There was a hole; it was unguarded and we had to walk around it." Then you say, "Oh, yes; I do remember, and I wondered why it was allowed to be there." This is the sort of consciousness which is active in patients who are not fully asleep,—not sufficiently so to have lost memory on waking of what has transpired during the sleep. Patients sometimes say to me, "I haven't been asleep; I heard you walk across the room and turn over your book; I kept my eyes closed merely because I supposed you wished me to do so." But the patient meanwhile has been relieved. I have actual contests with some of my patients who insist that they have not been influenced, and I have to say to them, "You will be kind enough not to have any opinion on this subject. It is impossible for you to judge. The fact that you are relieved is proof that you have been influenced." In the end patients acknowledge that they were wrong.

After a patient has come back to a thoroughly wakened state he may think that he has been intellectually awake all the time, but he has been in one of the first six of the nine stages into which Bernheim has divided the hypnotic condition. Some writers claim that there are but three different stages, but I prefer to accept Bernheim's nine stages, which are pretty sharply marked. In the first of these the patient is somnolent, but he is suggestible and can be

relieved in many ways. He can open his eyes and is perfectly conscious of all that is going on. In the second stage he is more suggestible. If told that he cannot open his eyes and is asked to try to do so, he finds he cannot. In the third stage automatic obedience and suggested catalepsy begin. If the physician wish to test the patient he lifts the patient's arm and there it stays. If asked as to whether he can put it down, the patient tries and finds he can do so. In the fourth stage he cannot put the arm down when once it is raised by the doctor. He may be sufficiently conscious to say "I cannot do it," and the arm remains in that position as though carved. It is pushed down with great difficulty, and when released immediately springs back into its place. Now, what is the cause of this? That man has lost his initiative. He cannot initiate ideas of himself, and the action of the mind which keeps the arm in a certain suggested position is governed by the suggestion which it received from the operator when he said, "You cannot put down your arm." In this condition of somnolence he is unable to create the idea, "I can put it down," and thus the idea which is dominant in his mind and which controls the muscles of the arm is contained in the suggestion, "You cannot put down your arm." In the fifth and sixth stages automatic obedience increases, so that if these tests are applied, and I very rarely apply them, the patient, in obedience to suggestion, will arise, will walk, or assume a given position, and, if the operator say, "You cannot come forward," or "You cannot go backward," the patient finds he cannot do so. This is called automatic obedience.

In all these stages the patient knows more or less of what you have said to him, and after he awakes remembers either indistinctly or very distinctly what has happened. Then comes a gap,—but to be brief, in the seventh, eighth, and ninth stages, the loss of memory is complete, and the patient after he awakes knows nothing of what has happened. In those stages hallucinability begins; one can cause dreams in a patient; make him think what one pleases, and, of course, automatic obedience is more pronounced. These last stages are very seldom reached in my experience. Among the French I have seen many cases in which these conditions existed, but the patients were mostly servants, or soldiers, or people who have been accustomed to obey, or hospital patients who have been long under the influence of hypnotic suggestion. They have no fear of it, and imitation has a very great influence. One patient sees another asleep, and when the suggestion is made he goes to sleep very readily. Perhaps it was due to this imitation that Lié-

beault attained the success he did, when, out of one thousand and fourteen patients, only twenty-nine were "refractory,"—that is, failed to be influenced into one or another of the degrees of which I have spoken. That success would never have been reached in this country, for the reason that Americans are not so suggestible as the French.

Now, in what way can this treatment be used? There is hardly anything in which I would not use hypnotic suggestion. Cases of neuralgia, rheumatic pains, loss of voice, stammering, nervous prostration, fixed ideas, intemperance, the cocaine and morphia habit, functional paralysis, wry neck, and many other ailments which I might mention, have yielded to suggestion at my hands. And the treatment is direct and immediate. There are many cases, of course, which require repeated application of the suggestion, and the amount of treatment necessary always depends upon the varying susceptibility of different individuals. You may ask, How can suggestion produce a functional effect? I will try to explain: Suppose I make a very personal remark to a lady. Her cheeks will redden at once. Now, how does this blush occur? The lady knows nothing about the mechanism of blushing; she is unconscious of the process; she cannot arrest nor create it. But, I have aroused in her mind an emotion, and the effect of this emotion passes out of those cells in which mental action takes place, and runs along the intricate nerve connections which finally carry it to the spinal cord. From the cord it passes into the sympathetic nerves which supply blood-vessels with the vaso-motor nerves. Under the influence of the emotion which I have created, these nerves momentarily lose control of the blood-vessels, which dilate, and the result is a flushing of the face, caused also in part by a quicker action of the heart, which is stimulated by these same sympathetic nerves and is also affected by the temporary mental agitation of the lady I have addressed.

This is a good illustration of the manner in which the heart is reached by hypnotic suggestion, and the same is true of any portion of the body; so that if, for instance, I have a patient asleep who has very cold hands and I suggest that those hands become warm, they will do so in three or four minutes. I have caused the heart of a patient to beat with absolute steadiness when it was losing every sixth beat, and these illustrations of the functional effect of suggestion are very common in my practice.

I have seen what seemed to be marvellous cures of intemperance, and perhaps the worst case was that of a man who was brought to me by his sister, who told me that he had been intoxi-

cated every night for twenty years. He was relieved of the habit so that he has felt no desire for drink for the past three years, and of thirteen cases which I have treated for intemperance, eight thus far seem successes. These cases are a proof that this treatment does not weaken the will. On the contrary, I strengthen the will of an intemperate person by suggesting to him that it will not make any difference how many men ask him to drink, that he has the strength of character to say "No," and the desired result follows.

Of course, chronic trouble requires chronic treatment,—that is an old adage. If an ailment be acute, as, for example, hoarseness, it can be relieved almost at once; and it is the same in neuralgias, rheumatisms, etc., of not long standing; but the cases which have lasted long enough to create a mental habit must be treated long enough to create another mental habit,—you have to plough another furrow over the one already existing, as it were.

With reference to the anæsthetic uses of suggestion, I may mention cases in which the introduction of the speculum was very successful, because the patients did not suffer the least pain. The patients were put to sleep; I introduced the speculum and made the necessary applications; and then aroused the sleepers and found them to be in a refreshed condition, instead of being tired, as would usually be the case. I have used suggestion in only one case of labor, and in that instance the patient was kept under the influence of suggestion for two or three hours, the uterine contractions continued as usual, and the birth would have been absolutely painless had the patient not begged me, during an interval of wakefulness, to leave her awake. I did so, but regretted it later. I have done some things with the knife, but surgery not being my specialty, I have had to wait for my cases; still I have performed some minor operations which would have been very painful, indeed, if the patient had not been under this influence. One case in particular was that of curetting an old abscess in the buttocks. The patient was in such deep anæsthesia that I could have amputated his leg without causing a particle of pain.

I am not an enthusiast in this matter,—I am simply a convert. I began to read about hypnotism some years ago; and the book I first read was on animal magnetism, by Binet and Feré, Charcot's assistants. This book was confusing and unsatisfactory, and, as I afterwards learned, was full of errors. I then went abroad, and spent two or three weeks with Bernheim and his associates, seeing things every day that seemed almost marvellous. After my return to

Boston, I began to use the treatment in cases in which it seemed better than the old remedies, and it has given me great satisfaction.

Now in regard to its use in your profession. A lady came to me who was very timid about having her teeth filled, and was very nervous; and as habit or experience, after a time, gives a physician who uses this treatment a very good idea of those persons who are likely to be suggestible, I decided at once that she was very suggestible. She said she had a tooth which needed filling badly, but that she did not dare to go to the dentist. I said to her, "Just come here and look into my eyes. Where is this tooth that is to be filled?" She told me, and I stroked the jaw a few times with my hand, and simply said, "It will not hurt you in the least to have this tooth filled." She afterwards told me that the dentist expressed surprise that she did not complain under the touch of his instrument, and that she herself thought the tooth must be dead.

You can see how very useful this treatment ought to be in your profession, and I dare say Dr. Fillebrown will tell you of many cases which will interest you. He has told me that he has kept patients in his chair for two or three hours in more or less consciousness of what he is doing and yet not suffering. Anæsthesia may exist in any one of those degrees of sleep which I have described to you. Of course, the anæsthesia is a suggested condition, and is based upon the suggestion "There will be no pain." There is one case on record of a woman who, during labor, was almost awake, and yet she was absolutely surprised when she found her child was born. She had received the application of hypnotic suggestion a number of times before her labor came on, and had become thoroughly convinced that there would be no pain. At the beginning of the labor her doctor put her into this semi-conscious condition, with the result which I have mentioned. This is a good example of anæsthesia which is as effectual as chloroform or ether, but without the bad effects usually attending the use of those anæsthetics.

Patients differ very much, indeed, in their reception of this influence. Some patients fall into a deep sleep and remain asleep during the entire time of filling or dressing a tooth, and should they become uneasy, they can be quieted by suggestions, such as "You won't awake," "You won't suffer any pain," "This will not hurt you," etc. Talk exactly as if the patient was awake; but—and this is a very large but—there is one thing that I wish to call to your attention: the men abroad who are prominent in the use of this treatment believe, as I believe, that the people who employ

it should have a medical education. You cannot play with this thing; you cannot properly use it without a proper education. There are a very few cases on record in which harm seems to have been done, but simply either from ignorance or foolishness on the part of the operator. He has played with his patient and amused himself. He has a very good subject, and he creates a certain abnormal hallucination, and does so frequently, the result being that, perhaps, the patient would begin to have that same hallucination in a waking state; or, these bunglers have put their patients to sleep by the use of some bright object, straining the eyes, thus irritating the brain, and doing injury in that way. Dr. St. Clair Thompson, in an article in the *Westminster Review* on the dangers of hypnotism, says that its use has produced lethargy in some people, and the newspapers have given accounts in which patients have fallen into a state of lethargy. These have uniformly been hypnotized by laymen for amusement, and a doctor having been called, he has failed to awaken the patient, and has resorted to electricity, stimulation, or some other means than the right one, simply because he also was ignorant of the proper methods. Now these cases beautifully illustrate the power of suggestion. When a person is profoundly asleep, and he does not awake at once on being ordered to do so, the person who has hypnotized him becomes frightened,—in all these cases we have to deal with the laity, not persons who have been educated in the use of suggestion,—and the by-standers then begin to try various methods, and scream into the patient's ear; and the patient himself, whose suggestibility, I suppose, you will all understand, was normally increased by the mere act of putting him to sleep, receives the suggestion that it is very hard to wake him, and he will sleep all the more profoundly. Then they send for a doctor. The doctor doesn't know anything about the necessary technique, and he uses some absurd method which produces no effect whatever. Finally, we will suppose, a doctor comes who knows something about suggestion, and he says to the operator, "Put me into relation with this subject. Just tell him that Dr. X. is here, and that he is to listen to him." That being done, the patient will listen to him. The doctor will then proceed in a confident manner, and perhaps press the patient on the top of the head, or gently pinch his ear, at the same time saying to the by-standers, "This always wakes a person," and then sharply gives the command to "wake." The patient receives the suggestion, and he will wake at once.

The inexperienced operator in his early application of suggestion

may have a lot of susceptible people at first, just as one is apt to have a run of rare cases. I remember at one time I had a series of six cases of angina pectoris, and I may never have another one,—it is not a very common disease. Well, he has a run of susceptible people, and he thinks it is all easy enough, and becomes careless, until finally he has a patient who is very nervous, and may give an inexperienced person considerable annoyance. One must adapt himself to every individual case,—cases differ. Involuntarily you treat your patients differently, according to the conditions which present themselves, and you would have to do so if you ever hypnotized; but it must be understood—and let me say that I think in any case it is a very great necessity—that every dentist should have a medical education. If I were a dentist I should be afraid all the time that something might happen to my patient, and if a very nervous person came to have a tooth extracted, I should not know whether it were a safe thing to give that patient ether or gas; and coming back to the feeling of the teachers of this subject abroad, I feel with them that whoever uses this method of treatment should go to some one who can properly educate him in the use of suggestion, and a dentist could then use it for the purpose for which he learned it,—that is, to give his patient a comfortable time in the chair. The dentist has no business to try to relieve every trouble of which the patient may complain, any more than I have the right to try to clear out a dental cavity without proper education and experience, because, aside from mutually aiding each other, as we should, we should protect and we ought to be just to each other. When dentists do take up this treatment, they ought to be as religiously careful in its use as I am. Do not use it until you understand it; if you do, you will get into trouble; and then when you do use it, let it be simply to keep your patient in comfort. When a patient comes to me for relief from a given ailment, I confine myself to that trouble. You can imagine how useful this treatment would be to you when you are operating for one of those very nervous patients who are constantly seizing your hand and jumping and crying, “Oh, I can’t bear this,” and so on. If you can keep such a patient quiet, you can do more work in the same space of time and with less wear and tear on your own nerves. But, as I say, in using it, you ought to be thoroughly educated in the technicalities of suggestion, and you should have a certain amount of medical education, so that if anything should happen to the patient you could meet the trouble. One day, I was treating a patient whom I had not seen before, and she was suddenly seized by an epileptic

attack. If I had not been a physician, I should have been very much alarmed, for, naturally, I should have suspected that I had caused it. The attack was a light one. I waited quietly, and it was soon over. I then said to the lady, "I suppose you often have these attacks?" and she replied, "Oh, yes, very often," so that, as I had supposed, it was nothing but a coincidence; but I should have been very uncomfortable if I had known nothing about it.

There is one thing I have not touched upon, and that is the danger. Physicians, otherwise intelligent, sometimes say, "I consider this treatment positively dangerous." Now, practically, such men know nothing about it. I have hypnotized a great many hundreds of times, and have not seen a single objectionable effect, nor do Bernheim, with his thousands of cases, and Liébeault, with at least fifteen thousand, record any instance where harm has resulted. In all these cases verbal suggestion only was used,—no artificial method. Of course, every man takes care to say to the patient while he is asleep, "You won't have any headache; you will feel refreshed after you awake," etc.; and these suggestions are answered in kind. Moll, a German, who has also written a fine book on this subject, says that this treatment is like the use of electricity, or the use of the catheter,—you have got to know how to use them. Every time a doctor gives a hypodermic injection of morphia, he is exposing his patient to more danger, a hundred times, than is the man who puts his patient to sleep, and the same thing is true of many other drugs which are used in medicine, where the fraction of one grain has been known to take life.

I don't know whether you are as frank about dentistry as some of us are about medicine, but the practice of medicine is very uncertain, and we don't know how drugs are going to act. Ninety-nine men may be helped by quinine, which is a specific for malaria, but when it comes to the one-hundredth man he is not relieved by it, and we have to try something else. Out of the long list of drugs which are used there are but very few which can be called specifics. Digitalis, we know, has a certain effect upon the heart; mercury in syphilis, and quinine in malaria. These nearly exhaust the list of specifics. The rest of our drugs are all experimental, and when Voltaire said that the practice of medicine consisted in "putting drugs of which we know little into bodies of which we know nothing," he expressed a great deal of truth.

The question has been asked me, "Is it not dangerous to let anybody hypnotize you?" I answer, yes; you must know your man; and if I were a dentist, and were going to hypnotize, I should

have some one present, or have a friend of the patient come, just as if I were going to give an anæsthetic; but if you have an absolute acquaintance with the patient, and the patient prefers to be alone with you, that would be another thing.

There is very great beauty (for want of a better word) in this treatment. It is the only treatment, except surgery, which goes directly to the seat of the trouble under treatment. When we give medicine, we are simply preparing the body to return to health. But there is an enormous amount of suggestion in the medicines which are administered. The same tonic is taken for many different complaints, and when it does not appear to be doing good, something is added which changes the taste, but which does not influence the effect of the tonic in the least degree, and the patient will begin to get better at once. While I was in France, I happened to pass through the town of Lourdes, where the Virgin Mary is said to have blessed the waters, and there I saw people from all over the world who were being cured of their ailments. This was, of course, an effect of suggestion. Then there are the electro-magnetic belts and rings which people use against rheumatism, etc., their effect is purely suggestive; and it seems to me that sincere homœopathy is nothing but suggestion, because certainly the idea that the smaller the dose the greater the effect is rather a curious one. The old-fashioned charms are plainly nothing but suggestion, such as the cure for warts, etc. A man is told to take a piece of meat,—it must be beef,—and he must rub the warts with it, and he must bury it under a certain tree at a time when the moon is at a certain height. Of course, this all seems very silly, but the fact remains that the warts do disappear,—of course, again, by suggestion.

You have need to be very careful as to what suggestions you make to those patients who are very suggestible. While I was with Bernheim he gave me several illustrations of the great susceptibility of some persons in a waking state. As we were going through the wards one day, he said to a man who was quietly sitting beside his bed, "Number 9, what was the trouble you had with number 7, this morning?" The man replied, "I had no trouble with him, sir." Bernheim said, sharply, "What do you mean by denying it? I want to know what the trouble was." The man knit his brows a moment, and then suddenly said, "Well, he stole my two-sous piece and I hit him." Now, there had been no trouble at all, and it was all a fiction of the man's brain suggested by Bernheim's remarks. On another occasion, as we were passing a patient, Bernheim said to me in a voice loud enough to be heard by the patient,

"No. 10 will go down to No. 4 and steal his night-cap." After we had gone by a little distance, I looked back, and saw the man straighten up, looking somewhat in doubt, and finally get up and walk straight down to No. 4, snatch off his night-cap, cram it into his pocket, and walk back very unconcernedly. We returned, and Bernheim asked him what he had been stealing. He said, "Nothing." "Turn out your pockets," said Bernheim, and out came the night-cap. "Where did you get that night-cap?" "I don't know, sir." "Well," said Bernheim, "I will tell you; you stole that night-cap from No. 4." The man protested that he did not, and seemed much distressed, for Bernheim made him go and return the cap to No. 4, whose face wore a look of great astonishment. Now, that use of suggestion seems to me cruel, but in this case it was justifiable, for Bernheim was simply giving me illustrations of the great susceptibility of some people in the waking state. I met an old gentleman, an acquaintance, on board ship on my way home, and in the course of conversation he said, "I do not like the nights at sea: I am awfully afraid to go to sleep at night, and don't undress at all." I said, "I think that is very strange: you ought to undress and go to bed just as you do at home. The ship is always under the care of experienced persons, and there is more care used at night than there is during the day." I thought no more of it, until this person came up to me afterwards and said, "Doctor, I have been turning that matter over in my mind, and I think I'll do as you advise to-night, and see if I cannot sleep." I thought to myself, "I believe this man is very suggestible," and therefore said to him in a confident and earnest tone, "I know you will sleep to-night: I haven't the least doubt of it." The next morning he came to me and said, "Doctor, I had a magnificent night. I went to my room and undressed, just as if I were at home, and slept profoundly;" and he told his friends that Dr. Osgood had simply broken up all his fear, and that he would now be able to sleep while aboard ship. Now, here was a man who was suggestible in the waking state, and who came to me accidentally. You can easily see that individuals, who are thus suggestible in the waking state, could be wronged by persons who know enough to make evil use of their susceptibility. Fortunately, such instances are very rare. Whenever I find that a patient is very suggestible, I protect him by saying to him while he is asleep, "No other person can ever hypnotize you, without my permission," and thereafter no one but myself can influence him.

Another point is the question as to who can hypnotize and who

cannot. I have learned how, and am sympathetic, patient, gentle with my patients: they feel at ease with me, and all those things help me. My patients have perfect confidence in me and trust themselves with me; but there are men who are also sympathetic, also gentle, who cannot seem to succeed in this, because they are timid, or they lack adaptability, or are very easily embarrassed by their patients.

The question is asked, Why is it that one man can hypnotize and another cannot? I will answer that question by asking another, Why is it that of two boys playing marbles, one of them can snap a marble the first time better than the other boy ever can? Why is it that of two boys one will make a good violinist and the other will not? And why is it that one man will make a good dentist, while another man cannot seem to make a success of it, try as he may? It is because he does not possess the necessary mechanical ingenuity. A lack of the power of adaptability, of natural skill, of self-poise, are probably the main reasons why a person cannot successfully hypnotize.

This subject is very large, and one thing suggests another. I have tried to make clear to you how this treatment acts and why it acts, but there are a good many things about which I have not spoken, and if any one wishes to ask me questions on any point he does not understand, I will try to explain.

THE USE OF CLASPS—BONWILL METHOD.

BY S. B. PALMER, M.D.S., SYRACUSE, N. Y.

THE February number of the INTERNATIONAL DENTAL JOURNAL contains a paper read before the Odontological Society of Pennsylvania, June 7, 1890. I do not write to criticise the paper, but the author is in fault in having hid so much "light under a bushel" for more than two years. The title of the paper is "New Method of Clasped Plates *versus* Movable or Unmovable Bridge-Work." I regard the contribution the most practical, beneficial, and scientific of any I have read on prosthetic dentistry. Every operation is so well illustrated that any one versed in the working of gold can produce the results claimed.

The writer of the paper, Dr. W. G. A. Bonwill, includes the word "*versus*" in the title, which might lead some to conclude that

the given method was the best, but conditions and circumstances must be considered in each case. I will not detract from Dr. Bonwill's contribution by claiming to have used his method before him, but will add some personal experience in the wear of clasp plates and unmovable bridges, which would give support to either extreme and in the durability or destructibility of clasp plates. I have witnessed in my own practice such varied results that I will venture to offer some well-known causes which will invariably produce corresponding results. First, to predict failure: Use thin elastic clasps well-fitted to the tooth, as wide as can be worn and without caps or tip, to prevent sliding up or down in mastication. The above conditions will bring about unfavorable results or loss of the tooth in from two to six years. The sliding motion wears the tooth-substance, the retention of food by decomposition and chemical action destroys the tooth much faster and deeper than is done by mechanical abrasion, while the closing up the clasp upon the tapering crown forces the plate into the gums and the tooth out of the socket where there is no antagonizing tooth. So much from observation in practice. The following is personal experience on the other extreme:

In 1848, forty-five years ago, the first operation or piece of dentistry I ever did was to insert for myself an upper silver plate of nine teeth with clasps upon a molar on either side, with no other instruction than Goddard's work, "The Human Teeth," bought for the purpose. Subsequently the silver plate gave place to gold, with another tooth added; later, rubber was tried, then swaged aluminum with rubber attachments; from that to cast aluminum, and back again to swaged aluminum. During forty-three years those molars were clasped with metal except a short time when rubber was used. One year ago one of the clasped teeth became loose from absorption of the process, the buccal roots became exposed, and the tooth was extracted; the crown was in good condition, enamel not worn through, and no decay. The other is firm and promises well for years to come.

What are we to learn from this extreme case of plate-support? First, that the teeth received quite as much support for their preservation from clasps as they in turn gave to the plate. The clasps were never wide, and only for a few years were they allowed to slide upon the teeth. When the teeth began to elongate, tips or caps rested upon the crowns which held the teeth firm in the sockets and the plate from sliding, which prevented wear as well as depression of the gums under the plate. Five years ago bridges were inserted below, which called for a cap over the ends of the molars to

secure articulation, in which some knowledge has been gained respecting removable caps. To return to the bearing of clasps, follow the suggestions and illustrations; let the clasps be narrow and bear upon the crown in three or four places only, and always have a tip resting upon some depression in the enamel upon the grinding surface. Avoid the drilled depression if possible. The majority of patients require automatic cleansing principles inserted with their work. What cannot be done in the construction of the piece cannot be depended upon by instructing the patient. Thus the spaces are beneficial except at the points of contact. The caps mentioned should not turn over upon the crown of the tooth so much as to touch the clasp and thus make a retaining place for food. I found it advisable to drill a hole through the cap upon the grinding surface which gives circulation and thus prevents decomposition of food lodgements. The change which food undergoes when confined around the teeth by any means for more than five or six hours will be noticed by any one giving the mouth proper attention.

A few words in regard to bridges. I could speak in quite as positive terms on the benefits of bridges on the lower jaw as has been done for clasps upon the upper. The bridge-worker needs to know what can be accomplished by clasps upon the principle described by Dr. Bonwill, to avoid the sacrifice of sound teeth, which becomes necessary when only such teeth are available.

We read of torture inflicted by savages in skinning their victims alive. Limited to a tooth, the operation of shortening and grinding up to receive a properly-fitting band is not less barbarous, nor can it be said that clasps are more destructive than this treatment.

THE USES OF HYPNOTISM IN DENTISTRY.¹

BY THOMAS FILLEBROWN, M.D., D.M.D.

MR. PRESIDENT AND GENTLEMEN,—I am happy to answer your invitation to be present this evening and say a word about the use of hypnotic suggestion in dentistry, and to demonstrate the manner of its application. Dr. Osgood has reviewed the history and de-

¹ "Smoke-talk" at a meeting of Harvard Odontological Society, held October 27, 1892.

scribed the nature of hypnotism and the uses of suggestion as a therapeutic agent; I will therefore say nothing on those points.

I am aware that for many years hypnotic anæsthesia has been successfully applied for dental operations to exceptional patients that could be hypnotized very deeply.

I remember my father did dentistry for a mesmerized patient previous to 1850. The patient had no knowledge of what was done, and suffered no pain. Others have done the same thing. Few patients reach this deep sleep, and it is of little importance in our specialty.

To make the lesser degree of hypnotic sleep useful and available is the problem I attempted to solve, and succeeded.

Professor Bernheim, Dr. Moll, and all other writers on hypnotism, state that pain will rouse the patient from light sleep, and they therefore cannot endure any prolonged operation.

Previous to my successful application, about one year ago, I am not aware that any one had made suggestion during the light degree of hypnotic sleep effective as a dental obtundent.

For twenty-five years I had considered this subject and believed there was something of value in it, but could not understand how it could be applied so as to be of use until I read Dr. Osgood's account of the case which he has referred to this evening, in which he said, "The suggestion ought to have been repeated in order to have kept her asleep until the culmination of labor." Here light dawned upon me, and I said, "If I can repeat the suggestion often enough, I can keep the patient in the anæsthetic condition during a prolonged operation."

I immediately acted upon this idea and accomplished the object, and maintained anæsthesia of sensitive dentine when the hypnotic sleep was so light that patients would declare they had not been hypnotized at all.

I hypnotize the patient before I begin, then touch the tooth to be operated on with my finger, and say, "This tooth and gum are anæsthetized, the sensitiveness has gone out of it, the silk will not hurt the gum. The cutting of the tooth will not hurt you, the dentine is anæsthetized. If it hurts a little, you will not mind it."

If the patient flinches, I wait a moment and renew my suggestion, and then again cut while keeping up the suggestion, talking all the while, the suggestion offsetting the cutting until I have accomplished the work without causing any pain to the patient.

Another great benefit which obtains is, the fears and nervousness of the patient are removed, so that, instead of grasping my hands

and jumping at my motions, they rest entirely quiet until actual trouble comes, and then so soon as it ceases their resistance stops.

Patients get up from an hour's sitting rested and refreshed. This is not the experience of a dental patient ordinarily. The practice of hypnotism has also remarkably increased my own power to manage and quiet patients and have things go well without any attempt to hypnotize.

With me the practice of hypnotism and the application of it to our calling is past the stage of experiment. At first I urged it upon patients; now I leave them quite free to choose. Most of my patients now know of it, and are ready and glad to have it administered, in order to save suffering.

I find it undesirable to keep a patient hypnotized long without waking, as it tires them. Some have roused up a little and said, "Wake me up, I am tired." It has become my habit to suggest rest and comfort, and wake the patient, and let them remain awake for a while, until the anæsthesia is needed again.

I have also noticed that after persons have been hypnotized a few times they get into the condition that needs hypnosis very much less than at first. They remain quiet, and the same sensitiveness does not appear in the teeth, and they appear to be decidedly different persons from what they were before.

An analysis of cases described in a paper I read before the Massachusetts Dental Society, on "Hypnotism applied to Dentistry," showed that in forty per cent. the anæsthesia of the dentine was complete, in thirty-five per cent. sufficient for all practical purposes, and in twenty-five per cent. additional means had to be applied. My later experience bears out this favorable showing.

I will describe a few of my most recent cases.

October 22.—A young girl, fifteen years old, had been a patient of mine from a child. I had never been able to do more than fill her teeth with cement in an indifferent way, with the cavity half excavated and with no attempt at making any proper shape. She was utterly unable to cease or abate her active resistance, though she would have been glad to do so.

I hypnotized her last spring, and she went through a whole sitting without touching my hand at all, a thing before unknown. She is now still more tractable than ever, and I can find no fault with her. At her last sitting I prepared an old cavity and filled it with gold, using excavator, chisel, burr, and plugger just as I wished. She sat and allowed all this without any resistance at all. I am sure of a desirable sitting to-morrow.

On the 21st of this month a lady wished to have a tooth extracted, but did not wish to inhale any anæsthetic. I said, "Try hypnotism." After explanation she consented. She hypnotized to a light degree; her resistance was all gone, and she felt perfectly willing I should proceed. She said she felt it a little, but did not suffer at all.

On the 19th I used hypnotism for a patient who had always been very nervous, and had great success in quieting her and almost entirely relieving the sensibility of the dentine.

On September 17 and 19, and October 11, 17, and 19 I gave sittings to a lady who had always been a terror to herself and dentist. She was very nervous and considerably rheumatic, and had been unable to think of having anything done to her teeth for two years. At the first sitting there was extreme nervousness and tremor, rapid pulse, not less than 100, and muscular system in a state of spasm. She was too excited to be hypnotized at once. I used wakeful suggestion, and found it effective. I talked to her quietly and seriously, and assured success. In a few minutes her pulse was about normal, and she said she felt entirely rested. I then hypnotized her, and thoroughly prepared for filling two proximal cavities in her front teeth. As she had just gotten up from a sick-bed, I thought best to let this suffice for the first time.

After every subsequent visit she left my chair feeling in a better condition than when she sat down. Her sittings were most of them in the afternoon, because she always felt better at that time.

Once she wished to come in the morning to see if it would not help her while feeling poorly. It fulfilled our expectations; she felt very much better than on other mornings.

This case shows how difficult it is to separate a specialty from the general knowledge and practice of medicine.

I agree with Dr. Osgood that whatever degree a man has, he must have considerable medical knowledge to be able to properly use this wonderful agent of suggestion either in the wakeful or in the hypnotic condition.

On the 15th I had a case in which I met the phenomenon of laughing, of which Dr. Osgood has spoken. More than half the time for hypnotizing had passed when she burst out laughing, saying, "You can't hypnotize me: I don't feel sleepy a particle."

I replied, "I think you are mistaken. I guess we will keep on." In less than fifteen seconds after that she was profoundly hypnotized.

I suggested absence of pain or fear. She opened her mouth

readily. I extracted a tooth, giving her no shock whatever and no pain.

It is only in exceptional cases that hypnotic anæsthesia is sufficient for extraction.

On the 12th I had another case for filling, which was entirely successful. This patient had previously had some mental treatment for disease.

I find such patients more susceptible to hypnotism than are those who have had nothing of the kind.

September 14.—I did some dentistry for a young boy for whom I operated last spring, and at that time he was very difficult to manage. While he was then willing to be hypnotized, his mother, who was with him, was not quite reconciled, and I could not use it.

On the 17th instant he had more to be done, and said, "They have all been converted out to the house, and you may hypnotize me." I did so, and it worked admirably. I could cut the dentine, and cleanse and form the cavities well, and fill them satisfactorily to myself without any resistance from him whatever. I was interested, when he woke up, in his rather graphic description of his condition. He said, "I felt just the same as a fellow does when he wakes up in the morning and finds his body all asleep."

These cases are sufficient to show my progress in the use of hypnotism since my published list, and I will not take more time now, but proceed to the more practical and useful part, the application of the method.

[Dr. Fillebrown here tried seven subjects, neither of which had ever been hypnotized, and succeeded in each case in obtaining a pronounced hypnotic sleep.]

WATT'S CRYSTAL GOLD.¹

BY FREDERICK S. HOPKINS, D.M.D.

WATT's crystal gold made its appearance many years ago, but it was very far from being the perfect article which we now have.

We often hear old practitioners say, "Crystal gold? oh, yes, I used to make it."

¹ Read before the Harvard Odontological Society, November 30, 1892.

He made it, used it for a time, and discarded it, because it failed to accomplish what it promised. This home-made article worked well, but soon disintegrated, pitted and flaked away, so that one trial was enough, and ever since crystal gold has been to him a synonyme for failure.

The simple mechanical ability to pack gold well does not in itself guarantee a perfect filling; and, although it is often said that it makes little difference what gold a good operator uses, yet we are continually finding gold fillings, put in by first-class operators, which have failed, not because the gold was not hard and well condensed, or through any faulty mechanical manipulation, the filling itself bearing every appearance of finished workmanship. Then why should it fail? Why should the tooth decay at the cervical margin any more with gold than with gutta-percha? Certainly not because of any peculiar antiseptic or preserving quality of the gutta-percha, but for the simple reason that, being plastic when put in, it makes an absolutely tight stopping.

Some one has made the statement that it was impossible to make an absolutely tight filling with cohesive gold. If he had said cohesive gold-foil, his statement would, perhaps, have been more nearly correct.

A filling does not necessarily need to be rocking or show discoloration around it to allow moisture to enter between it and the walls of the cavity. If you could examine the best of prepared cavities before the gold was placed in it, with a good magnifier, you would find not a clean, smooth surface, but a perfect labyrinth of flaws, scratches, and pits, which would show at once that nothing but a plastic material could fill them, and certainly not gold-foil. Unless every atom of exposed surface of that cavity comes into contact with the filling material, you will have numerous catch-basins in which decay may start, and often does.

Watt's gold, being made up of fine crystals, which have been left in almost the very condition in which they were deposited, and not having received the hammering or rolling which foil gets, retains its maximum degree of softness and adaptability with the greatest possible amount of cohesiveness, which are the qualities most sought for in cohesive gold. While, perhaps, it will not perfectly fill all the defective places in the prepared cavity, it will pack down into them and the retaining-grooves, where foil would bridge over, no matter how carefully condensed.

In this gold we find the fibre-like crystals running in all directions, and when packed hard it makes the toughest of fillings.

In some places, some of the so-called plastic golds might do as well, perhaps better, but in retaining-grooves and places where strength is demanded they do not, because they lack this fibrous quality, and fracture too easily.

Crystal gold is, as ordinarily used, a slow gold to work, but, if annealed in mica, it can be picked up on the plugger-point much more readily, and with very much less condensation, so that you dispense with the movement of carrying the gold to the flame and then to the cavity, and have your gold in much better condition when it is placed, so that, working it in this way, it is about as rapid as cohesive foil.

If you wish to carry more than one piece to the cavity, the slightest touch of the piece already on your plugger-point will carry it along. It should not be annealed in the naked flame, for the crystals are instantly melted and its peculiar softness destroyed, and any attempt at stuffing will most surely result in failure, for, although it may have the appearance of being well condensed, it is so only at the surface, underneath being soft and crumbling.

In small cavities it is especially useful on account of its great softness and adaptability, packing down with that dead, lead-like quality which makes it stay where it is put. In small, inaccessible approximal cavities, where there is scarcely room for the plugger-point, it can be tucked in with the point of the plugger where foil would be partially condensed before it reached the cavity. It is often convenient to start a gold filling in soft cement, and here the fibrous quality of the gold enables you to pack it in with great ease and without forcing the cement into your retaining-grooves, as you would be likely to do with the smooth-surfaced foil. You can use a fine, sharp point, and prick the gold several times into the soft cement, which will retain it finely, when, after the cement hardens, the gold may be packed down more solidly with a larger point, making a base which is firm and solid.

In combination fillings of gold and amalgam, in which the gold is packed upon the amalgam while soft, we have nothing which compares with this gold as a starter in the shape of foil. Some of the other forms of precipitated gold do well here, but no better.

Occasionally we have a case where the patient comes in with a portion of a large contoured gold corner of a central or lateral incisor broken, and the remaining portion is solid, well condensed, and otherwise in good order, and we wish to restore the contour.

The surface of the broken part may be freshened, made clean with chloroform, and annealed, when small pieces of Watt's crystal

gold will cohere with a tenacity which, I think, is impossible to attain with any other form of gold.

This gold comes prepared in several different degrees of condensation, but the number one, or the lightest, works best, the other numbers being apt to get too much condensed in handling, and the pieces which are picked off too thick. It is not a gold to be used to the exclusion of all others, but in certain places its peculiar qualities make it much superior to foil.

Reports of Society Meetings.

AMERICAN DENTAL ASSOCIATION.

(Concluded from page 281.)

Fourth Day.—Morning Session.

THE meeting was called to order by the president, Dr. Walker, after which the secretary read the names of the members of the different sections.

On motion of Dr. Crouse, the report of the committee that visited Washington in regard to the census law was called for.

Dr. John B. Rich, of Washington, responded as follows :

"Some time ago there was an attempt, on the part of the Census Bureau, to enforce part of their original bill in relation to dentists. Finding that by the terms of that bill they were not able to punish those who refused to answer the questions of the enumerators, they introduced into Congress a bill to punish them severely for failing to answer,—individuals as well as corporations,—and it was so carefully drawn that it passed through the House of Representatives without any one noticing its purport. When dentists refused to answer these questions, the census officials told them distinctly that in a little while they would be compelled to do so. It entered into every man's business,—the value of each tooth, how much he used each year, and every minute detail. It was on account of the peculiar inquisitorial character of this bill that the dentists of Maryland were aroused and started this movement.

"The attention of the society was called in May last to the bill

known as the Wilcox Census Bill, which gave the Secretary of the Interior and his subordinates the authority to include dentists in the schedule of manufacturers, and to compel them to give detailed statements of their entire business. Upon a careful inspection of this bill, it became apparent that it was a most outrageous attempt on the part of the Census Bureau to establish a legal inquisition over whomsoever they pleased, and, as the Census Bureau had already issued these questions to many dentists who refused to answer, it was very evident that the menace which was made to those who had thus refused meant something, and had not been an idle ceremony.

"The society resolved to resist this action of the Census Bureau. They therefore appointed a committee to attend to the matter, and the following gentlemen were named : Drs. Winder, Nelson, Waters, Volek, Mills, Genise, and Twilley. Every means possible was to be used to prevent the passage of this bill, and to have it so modified that it could not be applied to dentists. They were to confer with other State societies, and get committees to co-operate in producing the desired result. The committee entered upon its duties at once. A large number of copies of the bill were printed, with the objectionable part underscored, which, with a written circular, was forwarded to dentists in every State, urging them to use their influence to prevent the passage of the bill. Dr. Winder prepared an eloquent argument against the bill. A copy of this argument was sent to all the members of Congress, and was largely instrumental in educating them regarding the proper status of the dental profession.

"Dr. Winder then personally laid the matter before all the State societies he could reach, and communicated with the others. As a result of these exertions the State societies of New York, New Jersey, Pennsylvania, Maryland, North Carolina, and the District of Columbia appointed committees to attend to the matter. They met in Washington and agreed to organize under the name of the 'Associated Committees of the Dental Societies,' and work together for the objects for which they were appointed. They elected Dr. Rich chairman of the body. By this time the bill had passed the House and was in the hands of the Committee on Census.

"The following amendment was then ordered : '*Provided, That nothing in this act shall be construed as authority to collect statistics from professional men, such as lawyers, physicians, and dentists.*'

"They directed their chairman, Dr. Rich, to ask for a hearing before the Senate Committee on the Census, in relation to having

this amendment added to the bill, and if the application were granted to present the case on behalf of the dentists, to notify the members of the committee of the time of the hearing, so that as many as possible might be present.

"Dr. Rich applied to the chairman of the Committee on the Census for a hearing. This was accorded to him on June 27. In the mean time the chairman had written and sent to the different committees a circular, accompanied by copies of the amendment that the committee had adopted, and calling upon them to use all their influence with Congress, and the Senate in particular, to have the amendment introduced in the bill. Dr. Rich endeavored in every way to defeat the bill, in case the committee would not be in favor of the amendment. In this endeavor he was more successful than he had hoped to be. A Republican senator, to whom he presented the matter, became very much interested, and promised that if the bill should be reported to the Senate without the amendment, he would move to have it referred to the Judicial Committee, on the ground of its being unconstitutional. He also procured the assurance of a large number of Democratic senators in favor of the bill. At the hearing Dr. Rich presented the case for the dentists, and urged the insertion of the amendment presented. Argument on both sides of the question took place, and it looked as though the committee favored us. Superintendent Porter favored our views, and he finally said he did not wish to do anything that would place the dentists in a false position. Dr. Rich answered that if the superintendent would sign a statement, the dentists would be satisfied with such assurance, instead of having the amendment introduced into the bill. He agreed to this, and said that if Dr. Rich would come to his office the matter would be arranged; but Dr. Rich wished the matter arranged at once, in the presence of the Committee on Census. He then stated to the committee his understanding of the bill. Superintendent Porter signed the agreement on behalf of the committee. He then went to the Senate chamber, after the matter had been satisfactorily settled. The committee therefore beg to report that they were as successful in their resistance of this proceeding on the part of the superintendent of the Board of Census as could be hoped. The Associated Committees respectfully suggest that copies of the act be distributed to the dentists all over the country, so they may know what has been done for them, and as they have given this matter some attention, the committees suggest that the same be printed in a circular of four pages. They have had an estimate made of the cost of such a

circular, with the result that ten thousand copies could be obtained on good paper for forty-eight dollars."

Dr. Shepard moved that the report be received and referred to the Publication Committee.

Adopted.

Dr. Shepard.—On behalf of the Executive Committee, I would offer the following preamble and resolutions:

WHEREAS, Under a classification of dentists as manufacturers by the Census Bureau many members of the profession have made reports according to such classification; and

WHEREAS, Such classification was the subject of protest by the profession at large, resulting in the following proposed amendment to House Bill No. 7696, known as the Wilcox bill,—"*Provided*, That nothing in this act shall be construed as authority to collect statistics from professional men, such as lawyers, physicians, and dentists;" and

WHEREAS, As a result of a conference between the representatives of the dental profession and the Committee on the Census of the United States (Senate) and the Hon. Mr. Porter, superintendent of the census, an agreement was made that if the committee representing the interests of the profession would withdraw the amendment to the Wilcox bill he would carry out the spirit of the provisions of the proposed amendment, with the following agreement: "The superintendent agrees with the representatives of the committees to carry out the spirit of the agreement."

Resolved, That the American Dental Association recommends its members, and the members of all societies affiliated with it who have made reports under the foregoing classification, to forward to the Hon. Robert P. Porter a request to return to the writer his statement made to the census authorities, so that the same shall cease to be a public record.

Resolved, That this Association wishes to express its appreciation of the promptness and public spirit of the Maryland State Dental Society, the New Jersey State Dental Society, the Odontological Society of Pennsylvania, and other societies, in attending to this important matter for the benefit of the whole profession.

Resolved, That our thanks are tendered to Dr. Rich for his valuable assistance, and that an order be drawn on the treasurer to reimburse him for expenses incurred, as per memorandum hereto attached.

Resolved, That full power be given to the Executive Committee to act for the Association in this matter in the interim of this meeting and the meeting of 1893.

For the benefit of the members I will state that the amount expended by Dr. Rich is about fifty-three dollars.

Dr. Fillebrown.—Why is it not competent that this Association demand that the authorities return those statements without any further action?

Dr. Shepard.—As a matter of opinion, it seems to be a general demand, and not a personal one. A personal demand is a request which must be answered personally; a general demand can be thrown into the waste basket; so it is better to have each one write personally.

Dr. Crouse.—The Executive Committee has had this matter before them twice, and we think it wise to put it in a form that will do the most good.

Dr. Taft.—The superintendent of the census ought to be very thankful to return to us our schedules. If this matter had been delayed two days the bill would have been killed, because it intended to bring pressure on all the chambers of commerce and manufacturing industries in the country. Our chamber of commerce had appointed a committee to go to Washington, and if these gentlemen had not made this promise the fate of the bill would have been settled.

Motion carried to adopt resolution.

Dr. Rich.—Does the Association want the custody of this agreement made with Superintendent Porter? Mr. Porter considers that the statistics which he already has he is entitled to publish. I have had an interview with him since the signing of this agreement, and he still thinks he has the right to publish these statistics. In a long talk I had with him he said, "Write to me, and I will tell you what I will do." I said I would not do so until the matter had been brought before the American Dental Association. I said, "You must bear in mind every member of Congress has some relation with dentists, and if you get these twenty thousand men buzzing about you, you will find yourself in a hornet's nest." He made the argument that he had been put to considerable expense in collecting these statistics, and he had a number of letters from dentists who said they would just as soon give these statistics as not. I said, "If there are men in my profession who are willing to be classed as manufacturers, I think they should be classed with blacksmiths. I want you to class us with professional men, where we belong." While he does not want to publish these statements, he wants to make as good a showing as possible for the moneys which he has expended for the government.

Dr. Barrett.—It seems to me that it would be proper for the secretary of the Association to be the custodian of the paper, and yet I can readily understand the necessity of Dr. Rich having it, in case he needs it. It is a document which should be preserved in the archives of this Association.

Dr. Shepard.—I move that this document be accepted by the Association, with thanks.

Carried.

On motion of Dr. Barrett, the secretary was instructed to place this where Dr. Rich can secure a certified copy when needed.

Dr. Rich.—What does the Association want me to do about the matter?

On motion of Dr. Crawford, it was decided that one of the duties of Dr. Rich shall be to visit the superintendent of the census bureau and request him to return to the members all statements which have been given in by them.

Motion carried.

Dr. Shepard moved that Dr. Rich be appointed a committee of one from this Association to act as its representative at Washington. A scheme for sending out this letter has come to my mind. They could be sent out in the same envelope with the notice of the World's Columbian Congress, and not cost any more.

Motion carried.

Dr. Crouse.—In reading the minutes last evening, there was a record of a resolution passed here in regard to excluding exhibits from any place near the meetings of this society. I would like an explanation from the originators of this movement.

The President.—I offered that resolution personally, for this reason. It seemed to me that it was beneath the dignity of the president of this Association to come here at the appointed time and find but one member of the Association present. I think it was hardly the proper thing for me to go out into the hall and request the dentists to come in and help me open the meeting. It seemed they preferred to remain outside and examine mechanical appliances to be seen elsewhere. The change has been made in the Dental Society of the State of New York. The exhibits detracted from the attention of the meeting; it was almost impossible to get the members into the hall to attend to the business for which they were supposed to be in attendance; and since we have eliminated those exhibits we have had satisfactory meetings. I thought that as long as the plan worked very well there it would do so here. We are here to listen to papers and aid in advancing scientific and practical research, and not to look at exhibits of dental instruments and manufactures of all kinds.

Dr. Crouse.—If some one will move a reconsideration, I will state my reasons for speaking about this.

Dr. Smith moved a reconsideration, which motion was carried.

Dr. Crouse.—In making the arrangements for this meeting, the chairman of the Executive Committee instructed the local committee to state, in the contract for this hall with the dental-supply companies, that they should close their doors at the hour of our meetings and keep them closed. If we had not had them here, they would have gone to the hotels, and we would have had no meeting at all until ten or eleven o'clock. When this society gives us something that is worth hearing, and warranting us in paying the expenses of coming here, then the members will come. The supply men were perfectly willing to close the doors. If the exhibits were at the hotels, you could not get a meeting at all. I would like to have these men have their exhibits right in the room of the meeting, and then when the meeting opens have them curtain them off. If the members would rather look at dental instruments, it is because they do not care for the work of the society. Do not pull down, but build up! I had the agreement in writing, and they were willing to close their doors when the meeting opened. At Excelsior Springs and wherever we have had this condition of things it has been the same. If you want the profession to be here in numbers, you must give them something worth coming for. If the profession would get these matters systematized, the reports and meetings of the society would be so interesting that we would have to hire a much larger hall to hold the audience.

Dr. Barrett.—Why do we have these meetings,—for the benefit of the profession or for the supply people? Those supply houses do not want to come here. This year the S. S. White Company has not sent any goods to sell at all; they prefer not to, but, of course, if one company comes the rest must do so. If some resolution could be passed, the dental companies would not come with their goods. There are many persons who wish to buy goods. That is not the real purpose of these meetings. This is something higher and nobler, and those who are here for the purpose of examining dental instruments are of no benefit to us. They pay their dues, but they do not come unless the meeting is somewhere in their neighborhood. They attract others and keep up a continual talk in the outside rooms. It is not because I am inimical to the supply houses; it is for their benefit as well as for ours. We shall never get the papers that we ought to have as long as the Association is conducted on the present plan. That has been tried for the past twenty years, and this Association has not filled the place it should occupy. We have not the intelligence of the profession here as we should have. I do not mean to say we have

not the intelligent men, but I mean we have not all those who should be here. The present president of the Society wrote to the supply houses and asked them if they would stay away from the meeting of the Dental Society of the State of New York. They said that was just what they wanted ; but that if one house came they would all have to come. On the programme it was stated that no dental-supply houses would be represented there. We had a better meeting, more members, the finances are in a better condition, and the whole thing is decidedly improved. The present condition of the American Dental Association, with one hundred members present out of twenty thousand, is not the highest point to which this Association should reach. We do not come here to make money. It is not to peddle out privileges for selling goods. From the experience of the Dental Society of the State of New York, it is time to try something new and adopt the plan that they adopted with such great success. Every man who has been there can see the difference. I am not speaking against the supply houses, but I am in favor of trying another experiment, and of requesting that they should keep away from us.

Dr. Allport.—There is a sentimental and a practical side to this question. Every one comes to this Association for the purpose of being educated or to educate other people. Many come here with supplies that we perhaps know all about, and while I am opposed to it, there is a class of exhibits that should be made which is educational in its nature. It makes no difference to me or to Dr. Crouse whether they are brought or not, because we live in a large city where we can see these things all the time ; but it makes a great difference to many of the country dentists, who come for hundreds of miles to attend these meetings. It is entirely proper that these things should be exhibited here for the benefit of those gentlemen, not to buy a gross of teeth or half a dozen forceps, but for the new articles that are constantly being brought out. Let the rule be established that these places shall be closed at the time of opening our meeting. If they are not closed, it is because the president and the officers of the Association do not perform their duty, although it is an unpleasant one. If they do not live up to their contract, the supply men forfeit it. We want those things as much as we need papers. Go to a medical convention, and you will find exhibits of all kinds. They are a source of great education. I think that the chairman of this committee is exactly right, and while I agree with Dr. Barrett that we should have better papers, I do not see why the exhibits should be barred out.

Dr. Watkins.—When we came here to attend this meeting, we came for different purposes. As Dr. Allport said, when new articles are brought into the profession, it is just as necessary that we should learn what they are as it is to hear many of the papers which are read. I want to agree entirely with Dr. Crouse, and emphasize what he said in regard to the exhibits. I think in New Jersey we have as good meetings as in any State of the Union. The best meetings we have ever had have been where the exhibits were in the room where the meeting was held. Before the meeting was called to order the exhibits were covered, and there was nothing to be seen during the meeting. Consequently the people had to come to the meeting or leave the room. That rule can be carried out here, or anywhere else, if the exhibit is near the place where the meeting is held. If it is at a distance, it cannot be done; they must be closely connected.

Dr. Darby.—Dr. Barrett said that the American Dental Association did not draw together the intelligent and representative men of the profession. I would take exception to that remark. I think it does. I would ask Dr. Barrett to name half a dozen intelligent, representative men of the profession who are not present to-day.

Dr. Barrett.—I stated that this did not represent all of the intelligence that it should. I expressly stated that I did not desire to make any reflection on those who were here, but there is no member present who cannot think of a great many men who ought to be here. There are one hundred and fifty members present out of fifteen or twenty thousand, and that is not a fair representation of the intelligence. There should be five hundred or six hundred at the very least.

Reconsideration carried.

Motion made that the original resolution be laid on the table, which was also carried.

Dr. Taft, of the Committee on Necrology, reported resolutions on the death of Dr. John Allen. (Published in vol. xiii. page 844.)

Dr. Harlan offered a resolution of thanks to such railroads as had given reduced rates to the members of the Association, and also a vote of thanks to the chairman of the local committee, Dr. Cooley.

Resolution adopted.

Dr. Crouse.—I wish to speak of the Dental Protective Association, and urge the members to take hold of this work and carry it out in their respective States. There is now a test case in progress in regard to the bridge patents, and all testimony that is possible

should be presented to the Protective Association. It must not be thought, however, that when that case is finished our work will be ended. Many patents will be fought. If the profession would join as a whole the Association, the labor would be materially lessened. If we could get ten thousand members in the next four years, it would be a great gain, not only in the money received, but in the union of all, and if I should then need any testimony, I could readily write to our members and get it.

The Auditing Committee reported that they examined the treasurer's accounts for the past year and found them correct.

Report adopted.

The election of officers then took place, Drs. Ottofy and Thompson having been appointed as tellers, with the following result: President, Dr. J. D. Patterson; First Vice-President, Dr. J. Y. Crawford; Second Vice-President, Dr. S. C. G. Watkins; Corresponding Secretary, Dr. Fred. A. Levy; Recording Secretary, Dr. Geo. H. Cushing; Treasurer, Dr. A. H. Fuller.

Executive Committee.—Dr. S. G. Perry, Dr. W. W. Walker, Dr. D. N. McQuillan.

The final reading of the minutes then took place, and Drs. Thomas and McQuillan were appointed to conduct the newly-elected president to the chair.

Dr. Patterson accepted the office with pleasure, and made a few remarks, in which he stated that he had the welfare of the Association very much at heart, and would do all in his power to bring it up to a high standard.

Dr. Patterson then announced that the Publication Committee would consist of Drs. A. W. Harlan and E. T. Darby.

Adjourned, to meet in Chicago in 1893.

NEW YORK ODONTOLOGICAL SOCIETY.

A REGULAR meeting of the New York Odontological Society was held on Tuesday evening, February 21, 1893, at the New York Academy of Medicine, No. 17 West Forty-third Street, New York City, the President, Dr. Woodward, occupying the chair.

The minutes of the previous meeting were read and approved.

INCIDENTS OF OFFICE PRACTICE.

Dr. Brewster.—I met with a little accident the other day which I would like to relate. I had been treating a gentleman about fifty

years of age, whose lower left first molar was affected with periodontitis. A sac was formed after about six days, and I found it necessary to evacuate the cavity. I did so with full knowledge of what I was about to do. The lance entered properly, and I noticed immediately the spurting of arterial blood. I had taken every precaution not to come in contact with the artery. I let it go long enough to have the sac thoroughly washed out, and then I put pressure upon it to form a clot, and I had no further difficulty. Subsequently I made an examination, and found that the artery seemed very much nearer the bone than I had ever seen it. He was a very fleshy man. It may have occurred to many here, but this was the first time it had happened to me. I took especial care, too, that the edge of the lance should be towards the root.

Dr. Brockway.—I have been much impressed with the value of nitrate of silver in the treatment of caries of the teeth, as set forth in the papers of Dr. Stebbins, read before this and other societies; and I regard the ideas thus presented as among the most valuable that have ever been given to the profession.

Since the first of these papers was published—now nearly two years ago—I have made use of the method described in many cases with most gratifying results, and I think no one who saw the two little patients which Dr. Stebbins brought to one of our meetings, as exhibiting his treatment, could fail to be favorably impressed by the condition shown.

In this connection I wish to call attention to and commend a method of making application of nitrate of silver to cavities in the teeth employed by Dr. A. M. Holmes, and described by him in one of the recent journals.

The cavity being dried, a piece of gutta-percha is warmed and touched to some powdered crystals of the salt, then packed into the cavity, thus holding the caustic in contact with the surface to be acted on. This I have found to be a very simple and effective way of securing the desired result.

Doubtless many others present have made use of the treatment in question, and their experience would be of interest at this time.

Dr. Howe.—At the time Dr. Stebbins read his paper here I stated that in the summer of 1891 I had seen some of the cases he had treated, and that I had begun to treat cavities of decay in children's teeth with nitrate of silver immediately on my return in the autumn of that year. I would say now that I have seen within a few weeks some of the cases first treated,—more than eighteen months ago,—and found them in a very satisfactory condition. I

have come to regard this method of arresting decay as one of the most valuable additions to our armamentarium.

Dr. S. E. Davenport.—Nitrate of silver has been of considerable assistance to me, for although I have used it in but a small number of cases, in every one it has been satisfactory. For one little girl, whose teeth were quite a problem, by its use I have been able to check, without filling, the places which were most annoying, and which seemed to prove that the teeth were of very low structure. Two applications have sufficed to prevent the decay from spreading, and have taken from those teeth the extreme sensitiveness which was very troublesome before. In this little mouth there were decayed spots on the lingual side of all the sixth-year molars, as well as on the buccal surfaces, and the good results of the use of the nitrate of silver in those shallow, sensitive places causes me to think that the remedy has great value.

The president then introduced Dr. Dwight M. Clapp, of Boston, who spoke on the subject of "Combination Fillings," as follows:

Dr. Clapp.—It is now a little over four years since I read before this Society a short paper on combination fillings. That paper dealt exclusively with the combination of gold and amalgam. Within a few days I have looked over that paper again, and I find that, were I to rewrite it, I could not improve it, and to my mind the combination of gold and amalgam in the cases where it is indicated is unrivalled as a filling for the preservation of teeth. In the *Dental Cosmos* of July, 1892, there is an article dealing with various combinations, by Professor Miller, of Berlin. He states there, in regard to the joint filling of gold and amalgam, that its principal disadvantage is that there is no union between the two. Of course he refers to the old method of using gold and amalgam by first inserting the amalgam, allowing it to harden, and then forming a cavity in which gold is placed. A little later he refers to the article of which I have spoken, which I read before this Society, and he says that the accounts of the result of this work that have come to hand are very meagre, although satisfactory. I wish now to make a public expression of my own views and experience with this combination, and say that I regard it as a success, and that it is and will be one of our greatest helps. In fact, in the five years that I have used this method of filling, I have not found what could be termed a failure. I must admit that there has been a slight recurrence of decay in a few instances, but that was in cases where one might suspect faulty manipulation, and others that were very far gone to begin with.

I wish to say a few words in furtherance of combination fillings, and with some slight addition to what I read before you some four years ago.

Thinking that seeing is believing, I have prepared quite a number of specimens, and I hope they will do most of the talking.

The first specimen that I wish you to look at is a combination filling in the central, and with it is a cavity as nearly like the one that has been filled as I could make it. I would ask you to take particular notice of this specimen, because I shall refer to it later. In addition to gold and amalgam, I use cement very largely. Of course what I have to say to-night is not new to you. You have all used it probably in the same way that I do, but I would like to say one thing in regard to the successes and failures. I said the fillings, in my hands, for the last five years have been successes, but I have met with one great failure. It is this: although in the societies to which I belong I have talked combination fillings in season and out of season, yet I believe not one in ten uses combination fillings, and that not two per cent. of the practitioners know anything about the advantages and the great helps that come from them. In large cavities if we can so put in fillings that they make one mass with the tooth, provided the filling-materials are of the proper kind, it seems to me we are giving a better filling than if we put in something that is simply held in by shape. For instance, if you pile up a pier of bricks, you have simply a pile of bricks; but if you pile up a pier in which each brick is cemented to the other, you have more than a pile of bricks,—you have something that is solid and will hold. Consequently if we place in the tooth something that is cemented to it and held together all through, we have that which strengthens the tooth rather than weakens it. Do not misunderstand me. I do not mean that I place fillings in the tooth and depend entirely on cement for holding them in. I have been reported as doing that, with the meaning that I could not put them in any other way.

Another thing I wish to speak of in regard to this specimen is this: I made one like it and exhibited it to the American Academy in Boston, and I stated that the filling was put in with cement and gold, and it was finished with pieces of foil that I had picked up around the office,—meaning that it was gold that had been discarded for daily use. Not long since I was amused to read in the paper that “Dr. Clapp generally finishes with gold that he picks up around the office.” However, I suppose we must expect little mistakes of this kind.

Dr. Francis.—When Dr. Clapp uses the term “cement,” does he mean amalgam?

Dr. Clapp.—No; I mean oxyphosphate. My method is to prepare a cavity and place in it some cement. While the cement is soft, I put into it the filling-material, whatever it may be, gold or amalgam. In this specimen that I have here there is represented a dead molar with a very large cavity, involving the crown and the surface of the tooth clear to the gum. In this case, after the cavity is prepared, I would place in soft cement, and into the mesial portion of the cavity a little amalgam. In a minute or so, when the cement has hardened somewhat, I remove with an excavator the surplus cement at the edge of the cavity, so I have a cavity the whole opening of which is sure to be free from any cement. Then I place on the matrix and fill with amalgam, finishing with gold, or with amalgam alone, or with gold alone, as the case may be. The reason I have for putting the amalgam into the soft cement before adjusting the matrix is, that in most cases the opening to cavities is so small that if you adjust the matrix first, then place in the soft cement, and then the amalgam, you crowd the cement to the surface, and you cannot see to trim it off so as to be sure that none of the cement will come to the edge of the filling. In this particular case, I should now proceed with amalgam, and then with gold enough to cover it; then some more soft cement in the crown, and into that some gold, and when that had hardened I should weld the entire mass with gold. Then we have practically a pier built up with cement from top to bottom. The filling is a shell of metal, and to my mind the least metal put into the cavity, provided there is enough for strength, the better the filling.

The next specimen is where the cavity is somewhat like the one just spoken of, but in place of putting amalgam into the cement, I have used gold entirely. With this filling as it is now, I should adjust the matrix and finish the filling with gold, or perhaps with tin and gold.

I have here a sample of the filling of which I have just spoken, of cement and amalgam and gold. The cement was first placed, and a little amalgam inserted into that while it was soft; then the matrix was adjusted, a little more amalgam added, then sufficient gold to cover the amalgam, then more soft cement put into the crown, and gold into that, just enough of crystal mat gold to make a surface to build upon. It has not been consolidated. As soon as the cement hardens, mallet this down and finish with any cohesive gold.

Another class of cavities where I find it valuable to use cement is in the front teeth, especially in young teeth. We often find quite extensive cavities in the centrals, laterals, and cuspids in patients from eighteen to twenty years old. To fill with gold those cases where the teeth are of poor quality is somewhat disheartening, because we have all seen a few years later discolorations around these fillings, and they are not very satisfactory. In these cases I use cement, and while it is soft add the mat gold, and a minute after remove the surplus where it has oozed out, and then finish with gold. I formerly filled these by inserting the cement, letting it harden, making a cavity, and filling it as we would a simple cavity with gold. I find it much more satisfactory to put the gold into the soft cement, thereby uniting tooth and filling.

Here is a specimen of a completed filling. It shows amalgam at the cervical wall and is finished with gold. This is one of those cases such as we often find where decay has gone so far that when it is removed the cavity is in such a shape that it would not hold a filling, and to make it retain the filling we would either expose the nerve or very much weaken the tooth. You know that in a bicuspid, if we cut down to square the cervical portion of the cavity, we cut into the tooth where it is the weakest, and where teeth are so often broken. With this method of using cement, we simply have to take out decay, relying on the cement, *at this portion*, to hold in the filling. I do not say that I can rely wholly on the cement for retaining the entire filling; I think it is necessary to have, somewhere in the cavity, retaining-points that will assist in securing it; what I am trying to find out is how much reliance we can place on cement for holding in fillings.

Here is a specimen which will illustrate thoroughly, I think, the advantage of amalgam for the cervical portion of the filling. It is the specimen that has the matrix adjusted. It is nearly a shell. In many cases it perhaps would not do to fill a cavity of this kind with the weak walls that this cavity has, because if a very strong masticating force were brought upon it, it might fracture the walls; but in many cases a tooth no stronger than this can be made serviceable for many years. Often these give us much trouble. This is a distal cavity in a superior or inferior molar; the decay has gone below the gum, and has extended out laterally towards the tongue and cheek, and, what is more, it is a cavity where it is impossible to use the rubber-dam and make it stay below the margin. In these cases I have been in the habit of using the matrix first. We can carry the thin matrix down below the decay,

even down until we touch the alveola. Then the rubber can be adjusted over the matrix and the excavation finished. Of course, in these cases it is necessary to do most of the excavating before placing on the matrix, because we should not be able to see with it on. It is in this class of cases that amalgam is peculiarly serviceable. It can be packed against the matrix, leaving the main portion of the cavity open, into which cement can be placed and then finish with amalgam.

Tin-gold and soft foil and tin are remarkably good filling-materials, but, good as they are, you cannot use them in places that are inaccessible, where amalgam many times can be packed.

I have here several specimens in one. In the first place, here are two crown cavities with strong enamel walls, but very much hollowed out underneath. Those cavities might be filled with gold entirely, but it would be a long and tedious operation, and not particularly satisfactory when completed. Last Saturday I removed a crown filling something after this kind. Decay had extended in all directions. The filling was evidently carefully put in, but the shape of the cavity prevented a perfect packing of the gold. In these cavities I should put in cement. Here is another advantage of the cement. It is not necessary to waste tooth-substance in shaping a cavity. After the decay is removed, in most cases of this kind, no more cutting is necessary. Here is another case where a tooth is badly broken down, and it did not seem advisable to make a contour filling, and in it has been placed some cement and a little amalgam. The filling will be finished with amalgam. Here is another crown cavity where the cement has been put in and mat gold packed into it. Here is a cavity of gold and amalgam, which is partially completed. Here is a completed filling of gold and amalgam. In this special case it happened to be an upper molar, and it was so situated in the mouth that if amalgam had been placed in the bottom of the cavity, and the cavity had been filled one-third or one-half full, it would have shown from the outside; when the person opened his mouth, the black would have been unsightly. In this case amalgam has only been put on the lingual portion of the cavity, and the gold has been carried clear to the angle.

Tin-gold is a combination that has been used very extensively by certain operators. The first one to introduce it, I think, was Dr. Abbott, of Berlin, many years ago. To my mind it is a very valuable material. It is invaluable in many cavities. At the cervical wall of cavities, in place of amalgam, where a combination can be made of gold and tin-gold, it makes a most excellent filling. I am

using that now, in many cases, where I formerly used amalgam with gold. Cases that are difficult to fill in a very permanent manner are small pin-head cavities between bicuspid and molars, and between bicuspid. We often find a case where the mesial side of a sixth-year molar is decayed, and the cavity must be cut down from the crown. Next to that on the distal surface of the bicuspid is a small pin-head cavity. In those cases tin-gold is a remarkably good filling. In many buccal cavities of wisdom-teeth and molars it is excellent, and also in crown cavities of sixth-year molars. This specimen has four fillings in it,—two crown cavities, one approximal, and one buccal. I have had occasion to examine many of these fillings after a few months, and they have become quite hard. One advantage over amalgam is the greater malleability, and they never turn the tooth dark. The tooth is never stained from these fillings, although the fillings themselves turn dark.

In this specimen that I mentioned first, you notice that the cavity in the central that is not filled has a slight undercut at the cervical portion. Down at the point there is almost no cut whatever, neither is there any at the sides. That cavity is as near as I could make it to the cavity that has the filling in it. It was filled in this manner: Soft cement was placed in the cavity, and a little crystal mat gold crowded into it. The gold does not go into the retaining-point at the cervical portion of the filling at all. It is held in entirely with cement. I would ask Dr. Perry to take out that filling and test it. Here is an excavator, and if he will say how much strength he can find there, he will satisfy me as well as illustrate this. I wish to state that I have never put a filling of this kind into the mouth, because I have not yet the confidence to do it, and I simply made this as an experiment. I did put into a cavity of this kind a filling exactly like this, and exhibited it at the meeting of the American Academy in Boston. I asked the president of the society to take it out, which he did by placing it on the table, and with a large excavator removing it, and he not only took it out, but destroyed the tooth; so I thought I would try it again, and you see the result. This specimen, I find, is a failure. It is the gold that has given way and not the cement. Whether the fault was in putting it in, or whether the cement prevented the cohesion of the gold, I cannot say. Here is an opportunity for experimenting. In placing in these fillings, we must use more gold. I have put many fillings into teeth where the retention of the gold has been entirely by the cement, but there were undercuts in the cavity, and I have never had one of those fillings fail.

The amateur photographer is abroad in the land, and he has served me a purpose. Whether it will be of service to the rest of you remains to be seen; but here is a film of celluloid, such as is used by photographers. I have found it a most admirable capping for pulps. It is very fine, and by moistening it with spirits of camphor it becomes soft, and placed over a pulp will stick to the cavity, and it makes a very nice pulp-capping. Here are a number of films of various thicknesses.

A Member.—Why would not that make a good matrix? Then you could see into the cavity.

Dr. Clapp.—It would make a good matrix for amalgams and cements, but in gutta-percha the heat might affect it. I doubt, however, whether it would have the necessary strength for gold or tin-gold. I saw suggested somewhere, and I have been trying to find an opportunity of testing it ever since, the use of aluminum. I think the color would light up the cavity and make it very valuable. Gilded or silvered copper is also used. If there is any question to be asked in regard to this filling, I shall be pleased to answer.

Dr. Perry.—Will you tell us the degree of dryness of the amalgam that you use, and the kind of crystal gold, and also about how soft is the oxyphosphate, and how soon is the gold put into it? Also what kind of oxyphosphate?

Dr. Clapp.—I use various kinds. I have had a great deal of trouble with oxyphosphates in the last year. For a long time I used Fletcher's cement, which was admirable. I think it must be eight or nine years ago that I used it quite extensively, until the acid portion of it would come in the condition of jelly, and it would soon harden so it could not be used. Then I took up Weston's cement, which I used with much satisfaction until a little more than a year ago, when that became so bad that I gave it up. I tried various other cements. Dorsen's was very good, but it did not last in the mouth. After I had used Weston's, I took up Fletcher's again, but I do not think it wears as well as Weston's when it is good. Within the last two or three months I have been using Weston's cement again, and it works much better than it did a few months ago, but still not as well as formerly. Those are about all the cements that I have used to any extent.

A Member.—Have you tried Paulson's?

Dr. Clapp.—Yes, years ago; but I had difficulty in getting it. With the last employed I had the same trouble as with Fletcher's,—the acid portion became so hard that I could not use it. I have one show filling of Paulson's cement, however: it is in the mesial sur-

face of a superior wisdom-tooth, where it was very difficult to put anything else in. I saw the filling about eighteen months ago, and it was good, and I think it had been there nine or ten years.¹ That was a remarkable case of longevity. In using the cement with the gold, I have it as soft as very soft putty, but so it will hold its form when I put it in the cavity. I have been using for inside work Fletcher's cement more than any other, because it does not set quite as rapidly as Weston's, and it depends on how soon it does set before the rest of the filling can be completed. Usually by the time the matrix is adjusted, if amalgam be used, it can be placed in at once. It only takes three or four minutes if you are using gold. The kind of amalgam I have used more extensively than any other is Caulk's white alloy. I do not know that it is a perfect amalgam.

As to the dryness of the amalgam, I use it the same as I would to make an entire filling,—neither very dry nor very moist.

Dr. Perry.—Do you remove the excess of mercury by using first a portion of gold?

Dr. Clapp.—No; if I happen to have rather more mercury than I think is desirable, a little pressure brings the mercury to the surface, and I can scrape it off.

Dr. Perry.—You use the crystal gold invariably?

Dr. Clapp.—Formerly I used Steurer's plastic gold. Lately I have used White's crystal mat gold, although crystal gold could be used in cement where no amalgam is used equally as well as the plastic gold, and it also can be used in connection with soft amalgam, but it does not work as well. The great advantage of the plastic gold, to my mind, is that when you place an instrument on a piece of it you simply consolidate it. The instrument goes into it as your finger would go into a soft snow-ball, while the other is like putting your finger into a ball of cotton,—it pulls.

Dr. Francis.—In the combination of gold and amalgam, do you use gold-foil?

Dr. Clapp.—For making the union between the gold and the amalgam, I use a plastic gold. After the gold has thoroughly coated the amalgam the filling can be finished with any gold.

Dr. Francis.—Have you used gold-foil in that connection the same as plastic gold?

Dr. Clapp.—I have tried it, but have never made a success of it.

¹ I saw this filling March 23, and it was perfect. It has been in about fourteen years.

I doubt if Dr. Francis quite understands what I meant to say. It is this: after placing the amalgam into the cavity, I place the plastic gold immediately into it, and continue with the plastic gold until the amalgam is thoroughly coated with plastic gold and the filling looks like an ordinary gold filling; then any kind of cohesive gold is used.

Dr. Francis.—But would you not commence with gold-foil?

Dr. Clapp.—No; I am obliged to use the crystal or plastic gold.

Dr. Davenport.—Does Dr. Clapp care what proportion of cement is used? Does he use only a thin film of cement, or quite a good deal, if it be a large cavity?

Dr. Clapp.—I think that is immaterial, provided the cement is allowed to cover the entire portion of the cavity, with the exception of a thin circle at the margin; but I see no reason for making a large proportion of the filling gold; there is no benefit in it. We could just as well make the larger portion of the filling cement, and save time, and have a less amount of metal in the tooth, as long as we have sufficient metal to protect the cement.

Dr. Bogue.—Was the first specimen that Dr. Clapp passed around simply oxyphosphate and gold?

Dr. Clapp.—Yes.

Dr. Bogue.—That had only a thin film of gold. Is there only a small amount of gold in the cavity?

Dr. Clapp.—In this case there was considerable gold, because it was built up.

Dr. Perry.—You do not give the preference to Watt's crystal gold in making the union with amalgam?

Dr. Clapp.—No; I prefer the plastic. I have used Watt's crystal gold in only a few cases. It can be used, but it has not worked as satisfactorily in my hands.

Dr. Perry.—Do you prefer White's crystal mat gold?

Dr. Clapp.—No, I do not prefer it over Steurer's gold, except that it comes in a little more convenient form. The quality is no better than Steurer's.

Dr. Ives.—Since Dr. Clapp read his paper, four years ago, I have been an enthusiastic admirer and experimenter of that principle, in and out of the mouth, with a great deal of satisfaction and a large measure of success, and I feel like blessing him very often. Just now I want to speak of one case which he mentions, of a lower molar with a deep-seated cavity and good strong walls, in which he places oxyphosphate, which I consider a dangerous thing near the pulp. It is just in those cases that I would use the

preparation called Fletcher's nerve-capping, which is an oxysulphate of zinc. I have been using it for many years. It is perfectly non-irritant, and hardens in a very short time. I use it invariably in all those deep-seated cavities.

One other little point: I have never yet seen a matrix for this work that in any manner approached the one he showed us at that time,—a simple piece of German silver fastened with waxed floss. You can take a burnisher and get the contour you want. I have never found any later productions that could approach it.

The President.—We will pass this subject, and come to the paper of the evening, by Dr. J. Adams Bishop, entitled "Injuries and Diseases of the Mouth, and their Treatment."

Dr. Bishop then read his paper, and showed some illustrations and casts which he had brought with him.

(For Dr. Bishop's paper, see page 321.)

Dr. Bishop.—Here we have a picture of the four-tailed bandage; the next is Gibson's, which was introduced in 1827; here is Barton's, and the next is Hamilton's, which you find in both editions. The next is in Mulin's "Modern Surgery." There he has drilled through the front of the fracture and wired it together. You see these bandages are on the outside of the face. What will you find between that and the broken bone? Let me say, for illustration's sake, Perhaps you have been to Barnum's show, and have seen the iron-jawed woman who holds her own weight by her teeth while she is being elevated thirty feet. If the muscles can hold up that one-hundred-and-fifty-pound weight, what good are those bandages when the muscles are between the external bandages and the broken bone? What good would that wire do with a muscle that can lift one hundred pounds or more?

This model represents Dr. Gunning's splint; you cannot see the white and the black line so well on the board, but I will show you some models. Here I have a model of a fractured jaw which has no support. When you put on external bandages you do not help it much, but with this interdental rubber splint you see how steadily it is supported.

The first red rubber that is being passed around is the splint that Dr. Gunning wore in his own mouth. The next two are Bellevue Hospital cases. The fourth is a private case, that of a Mr. B——, on Washington Square, and the next is the splint that Secretary Seward had in his mouth. The next is the edentulous case, and the black one is what I would make now in all cases.

Dr. Bishop also exhibited some jaw cups which Dr. Gunning

considered useful for taking impressions in the country, where conveniences were not at hand.

Dr. Carr.—I have nothing new to say upon this subject. I have had considerable experience in the treatment of fractures of the maxillæ, and generally use for these fractures a modified Gunning splint. I must take exception to the essayist's treatment of the Barlow case. He describes the displacement as being inward and outward. In such cases I should use the wire splint invented by Dr. Hammond, of Paris, and improved by Dr. Gibson, of New York City; but in all fractures where the displacement is downward and upward, I should use a vulcanite splint,—either the modified Gunning, or the Gibson splint. An advantage of using the Gibson splint is that the patient has free use of the lower jaw.

I think the essayist is under a misapprehension when he states that fractures of the maxillæ rarely occur. Four such cases were reported in the daily papers of the past week. An explanation for the *apparently* few cases of fractured maxillæ may be given in the fact that these cases do not usually fall into the hands of the general practitioner, but are taken either to a hospital or to a dentist for treatment. If Dr. Bishop had treated the Seward case, he would have discarded all the external paraphernalia that he has shown us this evening, as being unnecessary for the treatment of such cases.

Dr. Perry.—It seems that Dr. Elliott saw Secretary Seward in Japan or China, and he said there was not complete recovery. We should like to hear a little more about this case.

Dr. Bishop.—There was some difficulty in the fracture on the right side, as I mentioned. The bicuspid tooth was very weak. The alveolus and the gum were receding, and the assassin had severed that duct and the large muscle, which made it very difficult. The duct discharged through that fracture for a long time, and made it very trying to heal. The tooth finally came away. There was union there, but you remember that Dr. Elliott saw Mr. Seward some six years after; besides, the man was a paralytic then, and he could not carry a spoon to his mouth. The conditions were very different at the time that Dr. Elliott saw the case.

Dr. Perry.—There was complete union, you say?

Dr. Bishop.—Yes; so he wrote Dr. Gunning. I saw Mr. Seward the next November, and there was nothing that indicated any such condition as Dr. Elliott wrote in his article ten years afterwards.

Dr. Carr.—Why do you keep the splint on from forty to sixty days?

Dr. Bishop.—It is not necessary in all cases; but in fractures

people are very careful, and they have more confidence with the splint on. If they wish, they can remove it earlier.

Dr. Woodward.—I met Mr. Seward while on his tour around the world, and I happened to be in company with him when he was eating some fruit. I noticed that he held his hand on one side of his jaw when biting. I had occasion to speak to a friend of his the next day, and he informed me that his jaw was weak. He did not say that there was not a union, but it was necessary, when masticating, to hold his hand upon one side of the jaw in this way.

Dr. Bishop.—It was very natural for Mr. Seward to find just such a condition as your president has reported. This case which I have here is one of absorption, so that the bone was as thin, almost, as a knife-blade, and broke of itself. The splint was put on, but the man only lived about a week afterwards. In Secretary Seward's case the molar and bicuspid had been extracted, and the injury to that duct made it very difficult indeed. I remember that there was a dispute. Dr. Gunning wanted to save the bicuspid, and Medical Director Wilson said it had better come out. I remember, in the fall, when Mr. Seward visited New York with Medical Director Wilson, they came to Dr. Gunning's office, and they had some words there about having the tooth out. Mr. Seward had such confidence in Dr. Gunning, however, that he left the tooth in. After that, I do not know what happened, but when he started to go around the world, I know he was a paralytic.

Dr. Francis.—I would move the thanks of this Society to Dr. Clapp for his excellent practical remarks, and also to Dr. Bishop for his interesting paper.

Motions carried unanimously.

Adjourned.

JOHN I. HART, D.D.S.,
Editor New York Odontological Society.

Editorial.

THE IMPORTANCE OF ATTENDING THE COLUMBIAN DENTAL CONGRESS.

To all readers of the dental periodicals, the meeting of the Dental Congress at Chicago, in August, is a subject of interest, as it marks an event which is to demonstrate the advanced state which den-

tistry has reached in the scientific elements pertaining to it, as well as the growth in its practical development. It may be questioned whether this general interest has excited the profession to a sufficient appreciation of the great value the meeting will have to those who may attend it, and the stimulus it probably will effect upon the succeeding decades. If it be well attended, and if the management shall control the opportunity with its possibilities, it will become a marked event in the history of dentistry.

To this Congress has been invited leading men from all parts of the world. Many of these occupy advanced positions in the countries from which they will come. They inevitably will have views to present in the modes of thought peculiar to them. Papers will be read by these which, from the nature of the occasion, must call out the best efforts of their authors. The men of our own country most nearly identified with scientific efforts will also be there, with whatever they may have prepared to lay before the minds gathered to do honor to the memorable occasion.

The ruling thought of those originating and managing the Congress was, and continues to be, to make it represent the highest professional and best scientific thought of the day. That purpose will continue to govern to the end. This being the leading and the animating motive, it becomes all interested in the welfare of our profession to make arrangements to be present. Neither personal feeling, if any such should exist, nor inconvenience should deter any from being one of the throng to welcome our friends, and to do whatever they may to further advance the position to which the science and art of dentistry has reached.

To those of foreign countries who have been delegated to attend, and to those who may not have had special invitation, the occasion is one which will well repay for the necessary journey, as they will have the largest opportunity to observe the multitudinous devices and methods connected with applied dentistry, which is a field in which, it must be conceded, America is predominant. To those of our own country it is of extreme importance they do not let the event pass without their presence,—not only that they may benefit by the higher features presented, but that the occasion may be inspired by the influence of numbers united in a common effort. It is also due the managements that a spontaneous response should be given to the labor which the officers of the Congress have been making to insure a successful result.

The plea which some have made, that the Congress is open to depreciation because the invitation to attend has been extended to

all qualified dentists, should have no value to deter any from giving the Congress the support of their presence. The intention is to make the meeting an educational one, with a warm international character. It will have much of the characteristics of the World's Fair, of which it is a portion. It is an exposition of the products of mind, and they who have this wealth to display, in so doing honor themselves and ennoble their motives. If only those who are engaged in developing the scientific features of dentistry were to constitute the Congress, it would prove a cold affair, and the proceedings would have little influence over our progress. There must be those to receive instruction as well as those to give it. So let the genius of democracy and the influence of numbers animate the meeting, that its potency may be widely felt.

Let us trust that both home and foreign representatives will be fully present at the Columbian Dental Congress, that the largest benefits may grow out of it.

* * *

OUR RECENT DEAD.

THE dental profession in the past two years has had to mourn the loss of many of its most active workers. The ever-present reaper has spared neither the aged veteran, crowned with honor, nor the earnest youth, ambitious to mark a path through the mazes of a world's civilization.

The recent loss of two such men as Watt and Allport recalls the period in which they were recognized leaders, an era replete with developments from crude surroundings to a professional life worthy of the progressive age of which we form a part. Their work was well done, and their eyes were able before the close to look forward and view the promised land which they had struggled through so many years to reach,—the condition of a self-sustaining and consistent professional life. They have passed away, and the dental profession honors their memory. It will be given to few to acquire the same dominating power over men maintained for years by these two prominent workers. The biographer will find it difficult, perhaps, to analyze this influence; but it existed, and now, as we write, it seems as though the loss of such leadership inspires a sense of loneliness. The mantles of the Fathers are falling one by one. Who is there to pick them up and wear them with equal power and honor?

We may stand by the graves of our honored dead and mourn the loss of their wisdom, but when we are called to pay the melancholy tribute to the young and active spirits who have faded from life and professional work, our hearts sink at the seeming sacrifice.

When we recall the untiring labor of Frederick A. Levy, we are reminded that, though "leaves have their time to fall," the autumn of this life had not been reached. It is hard to be reconciled to the inevitable, and to feel that in the great struggle still upon us his genial presence will no longer be with us.

Again the funeral-bells are tolling the requiem of a still younger man, one who had just begun to make an impress upon the scientific thought of his colleagues; and if the reaper ever succeeded in securing a "shining mark," he was successful when William F. Reh fuss was removed from our midst.

This loss comes very near to the writer's best life. He was a student among students, and his laborious work, concentrated within the compass of a few years, sapped the life forces, and he has fallen a devotee at the shrine of incessant labor. There is probably no other young man in the dental profession, and but few in any other, who has succeeded in accomplishing as much at his twenty-sixth year. His work on "Dental Jurisprudence" is a marvel of industry, and will carry his name forward on the roll of fame to many who will never know of his personality. It is impossible to feel satisfied with this loss. While we may rejoice in the work accomplished, it is accompanied with the sad reflection that it is to that labor to which we must attribute his destruction. It is the ever suggestive lesson that there is a limit to human endurance.

The bier is ever moving towards the cemetery. The mourners are ever asking the old, old question, "What is life that it should fade, and why are the voices of those we knew hushed forever? Where is the compensation?"

We have no answer to give to such, but to those who appreciate faithful work and honest endeavor the life of Dr. Reh fuss will ever remain an inspiration and incentive to greater perfection.

The carolling of birds will herald the coming spring-time, the flowers will bloom and shed their fragrance over our dead companions, the places which knew them on earth will be vacant forever, yet the impressions of thought which they made will be an ever-enduring presence, illuminating, elevating, and extending the area of work still left us to perform.

Our dead have passed from sight, but not from memory, and as

the gate of the cemetery closes and the body passes on, "ashes to ashes," this consolation is left with us, that this life

"Is but a suburb of the life elysian,
Whose portal we call death."

THE CONGRESS PROGRAMME—IMPORTANT CORRECTION.

THE editor of the *Dental Review* in the March number replies to a criticism of this journal, as follows:

"IMPORTANT CONGRESS NOTICE.

"The Editor of the INTERNATIONAL DENTAL JOURNAL is unfortunate in his interpretation of the printed order of business of the World's Columbian Dental Congress, recently sent out for publication. He objects to the daily 'Address before the whole Congress,' and says that 'The time given to addresses should be limited to the first day and the first session, and the other periods to scientific matters.'

"For fear others may fall into the same error of taking for granted that the daily addresses referred to are of a social character, we wish to make a plain statement to the effect that the matters treated on will be wholly of a scientific nature. The addresses will be from twenty to thirty minutes in length, and the subject matter will then be open for discussion before the whole Congress.

"The essential feature of these daily addresses consists in the requirement that they must be of general interest to the whole Congress, rather than of special interest to any one section.

"The Editor of the INTERNATIONAL DENTAL JOURNAL need not lament the lack of attention given to scientific work, for all the indications point to the fact that there will be more work of scientific value done in that one week of the Congress than ever was done before in an equal time in the history of the profession."

While it is a satisfaction to have this correction from the Secretary-General of the Congress, we cannot feel that the editorial in question was "unfortunate," but must regard it as having had a special value in settling the question of the addresses before the Congress. The unfortunate part was in the original wording of the programme, which should have been so explicit that no misconstruction could have been possible.

Bibliography.

ORTHODONTIA. By Dr. S. H. Guilford. New edition. Philadelphia, 1893.

We have been favored with an examination of the advanced sheets of this edition, which will be completed and for sale by the S. S. White Dental Manufacturing Company before this notice reaches our readers.

The first edition was so favorably received that another has become necessary. This has been nearly all rewritten, and every chapter altered to bring the work up to the present standard. Forty-two pages have been added and twenty-seven cuts have been taken out and fifty-two new ones inserted, with two pages of plate illustrations. Two new chapters have been added,—one on “Construction of Regulating Appliances” and one on “Electro-Plating;” besides these, many important contributions giving value and interest to the book as a whole.

The work is a thoroughly practical one from the first chapter to the last, the author having condensed with a skilful hand, apparently making all his work subservient to the one idea of clearly stating processes, so that the beginner in this difficult branch might have no trouble in following modes described. The author, doubtless from his long experience as a teacher, has learned the valuable fact that conciseness and clearness of expression are essential factors in a text-book. It is certainly very satisfactory in this respect.

The chapter on “Construction of Regulating Appliances” is a very valuable and important addition. The author’s practical knowledge and long experience have enabled him to give clear directions for the preparation of appliances and related mechanical work. His idea seems to be to make everything plain to the most uninstructed student, and that he has succeeded in this must be acknowledged.

This edition, with its many changes, may be regarded as a new book, as it brings up the subject to the latest date, comprising not only the author’s work, but that of a large number of others engaged in the same line of labor.

For the practical man no better book can be at hand for continual reference.

General criticism may be indulged in on some points of practice. This is to be expected, for probably no branch of dentistry presents a greater variety of opinion as to the proper course to pursue in any given case. This variety of sentiment and practice has had a depressing effect on the untrained mind, inculcating the fear that the regulating of teeth is the one branch of dentistry to be dreaded and, if possible, shunned. It seems to the writer of this that Professor Guilford has made the path so easy that the very natural want of confidence will give way to a desire to test his methods, as well as those he quotes from other authors.

The illustrations are excellent throughout, rendering the text perfectly intelligible.

A PRACTICAL TREATISE ON ARTIFICIAL CROWN- AND BRIDGE-WORK.

By George Evans. Third Edition, Revised and Enlarged, with six hundred and thirty-one illustrations. The S. S. White Dental Manufacturing Company, Philadelphia, 1893.

There is, perhaps, no better evidence of the advance made in mechanical dentistry than the introduction of such a work as this. Many of those yet in practice can well remember when but two forms of crowns were in use,—the old wooden pivot and the gold pin inserted in various ways, with tube and without. It is astonishing that these held so long in practice without any material change, but this came at last when other things of more importance had been, in a measure, settled, and the inventive mind was left free to turn its faculties in other directions.

From the time of the first introduction of other forms, a comparatively recent period, the growth in this direction has been the most remarkable of any of the procedures in dentistry. The truth of this is amply set forth in the very satisfactory volume just issued.

This, with its three hundred and forty-six pages and six hundred and thirty-one illustrations, sufficiently demonstrates the industry and care of the author to secure all improvements made in crown- and bridge-work, but so prolific has the labor been in this direction that many suggestions made since its issue must be deferred for a fourth edition.

After several chapters on the preparatory "Treatment of Teeth and Roots," the author begins with the consideration of the crowns, commencing with that of Bonwill, and then continues through the various forms of crowns up to the use of the "gold collar," and from this, by easy gradations, to bridge-work in all its different

forms. So thoroughly is every step properly illustrated, that it would seem impossible for the beginner to fail in following the text and become an expert without any other aid to guide him.

The third edition seems to leave nothing to be desired as a text-book for students, and as a work of reference to those skilled in metal-work. In every respect this book is a credit to the author and the publishers, the S. S. White Dental Manufacturing Company. The illustrations are very superior in an artistic sense, and throughout there has been nothing omitted to make it satisfactory to the student and general reader.

Obituary.

W. W. ALLPORT, M.D., D.D.S.

DR. W. W. ALLPORT died at Chicago on Tuesday, March 21, 1893. His death was due to meningitis preceded by erysipelas.

The death of this remarkable man has increased rather than diminished the interest felt in his personality during his life. He was one of the very few connecting links binding the new order of dentistry with the transition period. His long life of activity and earnest advocacy of a higher standard of work made him a prominent figure in all the labor of the profession. His pronounced views and marked ability in giving them utterance invariably claimed attention. He was emphatically a leader among men. He began the work of his life at such an early period that but few in active practice at the present time can realize that Dr. Allport has been an authority for fully forty years. The writer of this can well recall the interest felt in any suggestions from his pen as early as 1854. From this time to his last sickness he has been untiring in this work.

The last time the writer met him was at the meeting of the American Dental Association, at Niagara Falls, August, 1892. He seemed then to be as vigorous and as full of life as any present. Few will forget his lucid explanation at that meeting of the use of soft gold, and the energy with which he entered into the collection of funds for his old friend and co-worker, Dr. Dwinelle.

He has passed away, and with his departure will go much of the

antagonistic feeling engendered by his honest and vigorous protests against what he considered wrong, and in its place will come a clearer conception of his true character.

We have not space to enlarge more fully upon this theme, but leave him with the conviction that dentistry has never had a better exponent or one more fully fitted to build from its disorganized elements a profession worthy of the respect of men.

We are indebted to the *Chicago Tribune* for the following details of his life :

"Dr. Walter Webb Allport was born at Lorain, Jefferson County, New York, in June, 1824. He was of English descent, and Sir James Allport, one of the greatest railroad men in England, and Dean Allport were his cousins. In 1844 he entered the office of Professor Amasa Trowbridge, at Watertown, to study medicine. In 1846 he determined to devote his attention to dentistry, and in 1853 entered the New York Dental College in the double capacity of student and demonstrator. He graduated from that institution in 1853, removed to Chicago in 1854, and has practised his profession here ever since. He married Miss Sarah Maria Haddock at Watertown in 1847. Dr. Allport's beginning in Chicago was a modest one. A room seven by eight feet in size on Lake Street furnished ample accommodations for him and a physician. Dr. Allport occupied one corner of the room. His operating-case consisted of a board nailed across the angle and covered with a newspaper, and his chair he had rented from a barber. His earnings for the first two months were twenty dollars and thirty-nine dollars, respectively. A few years ago he discovered an old lady in one of whose teeth was the first filling that he made in this humble office, showing that from the first he had been a skilful operator.

"In 1858, Dr. Allport was elected President of the Western Dental Society; in 1860 he was elected the first Chairman of the American Dental Association; in 1865 he was elected President of the American Dental Convention; and in 1886 he was elected President of the American Dental Association. In 1881, Rush Medical College conferred on him the honorary degree of M.D., and for many years he was Emeritus Professor of Dental Surgery in that institution and in the Chicago Dental College. He was the means of creating the Dental Section in the Ninth International Medical Congress which met in Washington in 1887, and was made Vice-President of the Section. He was one of the organizers of the Chicago Microscopical Society, and for a long while its President. He was largely instrumental in the organization of the American

Dental Association and in projecting the World's Columbian Dental Congress to be held in Chicago this summer. He was also the editor for two years of the *People's Dental Journal*.

"Dr. Allport was a man of venerable and distinguished appearance, with a commanding figure, a noble head, and features expressive of intelligence, precision, honesty, and courage. Like all positive characters he had devoted friends and unforgiving enemies, but both alike respected his integrity and his independence. He was a member of Grace Episcopal Church, and was at one time an active Mason, but latterly he belonged to no club and no secret order. He always found his delight in his own home with his large and interesting family."

The following analysis of his character, furnished us by Dr. E. S. Talbot, will be read with interest. Dr. Talbot's long intimacy with Dr. Allport gives especial value to his views at the present time.

"Dr. Allport, in his way, was one of the most remarkable men in the profession. He detested fraud, underhand work, and wire-pulling for the sake of office. He was continually fighting these things, hence he gained for himself many enemies. He was not in the strict sense of the word a scientific man, although he did considerable original labor in the early days. He was always anxious to do his part to help along the cause. One of his methods was to try to organize societies on a strictly honest basis. His great work was in the American Dental Association. In the International Medical Congress he overthrew all schemes and made a grand success of the Dental Section.

"Dr. Allport did not care for notoriety, although many regard this as one of his faults. His character in this respect I am familiar with, as he frequently consulted me in regard to what position he should take in a given case. He did not care to become President of the Dental Congress, and often said if he could not get the position without politics, he would not have it. Six years ago he saw that there must be a Dental Congress in this country, although he was opposed to it, as he believed that the International Medical Congress was all that was necessary, yet he went to work with a view of making it a scientific affair, far above what the ordinary dentist had anticipated; but not being satisfied with the course pursued, he became discouraged and let the matter drop. Dr. Allport, to my knowledge for the past ten years, has spent his time to help the profession, and not for personal gain. He refused the presidency of the Dental Section of the Fourth International Medical Congress, because he was satisfied with what he had accomplished

in the organization, and did not care for the honor of the position. He was a man far above the average dentist, and could see farther into the future, both in dentistry and business affairs, than any man I have ever seen. Our best men consulted him in regard to business and investments in real estate. He was a thorough gentleman in every respect. It was not generally known, but he possessed a kind, sympathetic nature. I have seen tears in his eyes many times in sympathy for the misfortunes of others.

"In 1874, Dr. Allport delivered the anniversary address at the American Academy of Dental Science, Boston, advocating the divorcement of prosthetic from operative dentistry. He foresaw years ago, that in large cities dentistry must be divided into specialties; that mechanical dentistry must become a special and a distinct branch, not requiring the same amount of study required of operative dentistry.

"Dr. Allport's best literary work was done in his earlier days before I knew him. He edited a journal called the *People's Dental Journal*, and at that date (1863-64) it was considered a valuable production in that particular line of literature. His articles were read by all dentists with great enthusiasm, since they contained so much that was of interest to practitioners. I am told by older members of the profession that the *Journal* was glanced over as soon as received to see if there was something from his pen. He was chairman of the Section of Dental and Oral Surgery twice, and had read the following able papers before that body, published in the *Journal of the American Medical Association*: December 8, 1883, page 637, 'A Case of Amaurosis dependent upon Dental Irritation;' February 7, 1885, page 147, 'A Case of Vicarious Catamenial Hemorrhage of the Gum, with Recession of the Gingival Margin and Alveolar Process, the Result of Amenorrhœa;' August 17, 1889, page 229, 'Facial Neuralgia consequent upon Pregnancy.' It will be seen by the subjects that the doctor was a very broad man in his study, and was well up in a general way upon all diseases of the body. His papers upon dental subjects will be found in the *Dental Cosmos* and the Transactions of the American Dental Association."

The closing services were held at his home Wednesday, March 22. The interment took place at Graceland Cemetery, Chicago.

WILLIAM FREDERICK REHFUSS, D.D.S.

DIED, of Bright's disease, on the 28th of March, Dr. William F. Rehfuß, aged twenty-six years.

Dr. Rehfuß was born in Philadelphia, March 1, 1867, of German parentage. He received his education in the public schools, graduating with honor at the Central High School in 1884.

He began his professional studies with Dr. Thomas Robson, of Philadelphia, with whom he remained one year. He matriculated in the Department of Dentistry, University of Pennsylvania, graduating in 1887.

During his student life he was the representative from this department on the editorial staff of the college paper, *The Pennsylvanian*.

After graduating he opened an office in Philadelphia, and also one during the summer months at Ocean Grove, N. J.

He was an original worker, spending his leisure hours principally in his private laboratory writing and experimenting.

The fact that no book on dental jurisprudence existed, early claimed his attention, and with his usual energy he proceeded to carefully train himself to prepare such a work. He labored unceasingly at this for several years. Very few, it is surmised, as they refer to this book now, can appreciate the great labor bestowed upon it,—a labor which undoubtedly laid the foundation of the disease which ended his career. When it was finally prepared, he was met by the discouraging fact that none of the large publishers would touch it. They naturally feared financial loss. To the credit of the Wilmington Dental Manufacturing Company, the risk was taken; and not only this, but they spared no expense to produce it in a satisfactory manner. The result justified the hopes of the author and their expectations, as it is now the standard work on the subject.

In addition to this labor, he has been a prolific contributor to various societies. His articles on dental massage were widely read, and regarded as of special value in a new line of treatment in dental pathological conditions. He also wrote on other topics. Among the few of the many written now recalled are "Antisepsis in Dentistry," "Abstract or Dental Laws," "Internal Medication in regard to Dentistry." The latest work on which he was engaged during his last sickness was a serial contribution, in collaboration with L. Brinkmann, M.D., on "Oral Diseases, Surgical and Non-Surgical,"

illustrated by colored plates. These articles were to be continued through the year.

He was a member of the Odontological Society of Pennsylvania, and at the time of his death its corresponding secretary. He was also a member of the New Jersey State Dental Society and the Dental Protective Association of the United States.

His interest in society-work and ability in the preparation of interesting papers led to frequent invitations to take part in distant organizations.

Socially he was well known in his native city, and during his earlier years took an active interest in amateur theatricals, having managed several of the leading amateur societies.

The trustees of the New York Dental School elected him Professor of Dental Jurisprudence, and he was looking forward to this work with great interest.

He was engaged to be married, at the time of his death, to Miss Helen Lawson, of Brooklyn, N. Y.

His funeral took place from his father's residence on March 31, 1893.

DR. FREDERICK A. LEVY.

DR. FREDERICK A. LEVY, aged forty-two years, was buried March 23, 1893, at Rosedale Cemetery, Orange, New Jersey.

Frederick Arthur Levy was born in Richmond, Virginia, and received a collegiate education in the College of Mobile, Alabama, after which, coming North, he entered the dental office of E. Parmly Brown, remaining there a year. He then entered the Baltimore College of Dental Surgery, and graduated in 1873. He settled in Orange, New Jersey, in 1874, and during the Centennial year became a member of the New Jersey State Dental Society at the meeting held at Atlantic City in 1879. He was subsequently elected President of the Society. Serving one year in this office, he was elected on the Board of Examiners. Upon the passage of the new law of the State Board of Registration and Examination in Dentistry, he was made the President of the Board, and held this office at his death. Dr. Levy was ex-President of the Central Dental Association of Northern New Jersey, Vice-President of the American Academy of Dental Surgery of New Jersey, Secretary and Treasurer of the National Board of Dental Examiners, Corresponding Secretary of the American Dental Association, and held

the positions of chairman of the Registration and Finance Committees of the State for the World's Columbian Dental Congress.

To one who was more closely associated with him than any other member in furthering the cause of dental education and placing the profession on a high standard in New Jersey, no tribute that the writer can pay is adequate to the case. He never labored selfishly for power or professional advertising, but with a high sense of honor everything was done for the credit of the Association. He abhorred shams, and against these was outspoken and bitter in his denunciation. Everything done in the societies was by him performed for the glory of the organizations. His time, money, and voice were always at their service, and his unselfish work was recognized and acknowledged by all the members. Any office in their gift was at his disposal, and his advice was listened to with great respect.

A young daughter thirteen years of age survives him.

He possessed a modest library on dental matters, which no doubt will eventually be in the possession of the society, to be known as the "Levy Library."

The society and the profession have lost a valued member, and his intimates a true friend.

CHAS. A. MEEKER, D.D.S.

NEWARK, N. J.

RESOLUTIONS ON THE DEATH OF FREDERICK A. LEVY, D.D.S.

WHEREAS, In the death of Frederick Arthur Levy, D.D.S., our associate and valued member of thirteen years standing of the Central Dental Association of Northern New Jersey, the society has lost one of its most worthy and honored members, a man of sterling professional feeling, generous impulses towards his friends, and desire for the advancement of this society, therefore be it

Resolved, That the above expression of our regard and regret be placed upon the minutes of our society, and a copy forwarded to his surviving relatives and to the leading dental journals for publication.

CHARLES A. MEEKER, D.D.S.,

GEORGE E. ADAMS, D.D.S.,

WILLIAM L. FISH, D.D.S.,

Committee.

Notes and Comments.¹

NITROUS-OXIDE-GAS MORTALITY.—Dr. J. D. Thomas, in writing upon the subject of nitrous oxide, says, “Professor Wilbur F. Litch, in an article upon anæsthesia, published in the ‘American System of Dentistry,’ has made a very careful and complete compilation of all the fatal cases attributed to nitrous oxide, and he there shows eleven cases of death; but in a recapitulation he eliminates four of them from the list as being in no way connected with the gas. Of the seven remaining, you will notice five of them occurred in Europe and but two in this country. If, as they say in stock speculation, we strike an average by dividing twenty-eight, the number of years in which nitrous oxide has been in use, by two, which would give fourteen, and multiply the annual number—750,000—by it, we would have 10,500,000 people who had taken the gas in this country, with but two deaths resulting therefrom. Of these, the first occurred in 1864,—within a year after the beginning of its use. It is said the patient recovered from the effects of the gas and walked into an adjoining room apparently well; he shortly returned and complained of shortness of breath, sank upon a sofa, and expired in a few moments. The coroner’s verdict was that death was caused by congestion of the lungs, induced by the inhalation of nitrous oxide.

“It is difficult to comprehend how the inhalation could have produced congestion of the lungs, as an after-effect to have caused immediate death; and I would be inclined to think it more from nervous depression and final heart-failure, which could have been from reaction rather than congestion.”

NITRATE OF SILVER.—There is much accumulating evidence in regard to the uses of nitrate of silver in dental practice. In addition to its value in the treatment of dental caries, abrasion, etc., it is proving to be quite efficient in the treatment of erosion. Professor Peirce’s recent communication to this journal in regard to

¹ The assistant editor solicits contributions for this department,—new methods, new remedies and formulas, or any short practical note which may prove of value to the practitioner or student. Address 1506 Arch Street, Philadelphia.

the preparation of nitrate of silver in the form of small pads—by saturating a piece of blotting-pad with a forty-per-cent. solution—is a valuable and timely contribution to the subject. He neglected, however, to speak of the necessity of protecting it from the atmosphere and sunlight, as it is decomposed by the influence of these. It should therefore be kept in a dark-colored bottle having a ground-glass stopper.

THE GENESE CROWN.—Dr. Genese, of Baltimore, recently read a paper and gave a clinic before the Pennsylvania Odontological Society, demonstrating a new method of constructing crowns. We call especial attention to this, as the method is an exceedingly simple one, and is capable of easy modification to meet the exigencies which occur in practice.

ORAL HYGIENE.—In the March issue of the *Dental Cosmos*, Dr. Kirk contributes an excellent editorial on the subject of “The Hygiene of the Mouth.” It is such plain, practical papers that are the most helpful to the average practitioner and student. The doctor urges renewed efforts from the profession in the way of researches upon the subject, and among other things says, “The value of a careful and accurate study of the best means of securing immunity from diseases, both general and local, by means of suitable antiseptic and hygienic measures, with reference to the oral cavity, is unquestionable. That the best means at present in popular vogue is insufficient will not be gainsaid. More light is needed in this direction. Shall it not come from our own ranks?”

Current News.

ILLINOIS STATE DENTAL SOCIETY AND IOWA STATE DENTAL SOCIETY—JOINT MEETING.

THE Twenty-ninth Annual Meeting of the Illinois State Dental Society will be held at Rock Island, May 9 to 12, inclusive. The Thirtieth Annual Meeting of the Iowa State Dental Society will be held at Davenport, May 9 to 12, inclusive. These cities are located on opposite sides of the Mississippi River, and arrangements will be made to hold the meeting jointly, so that those in attendance at

the meeting of either society will have an opportunity to listen to the papers, take part in the discussions, and witness the clinics of both societies. No efforts will be spared to make this union meeting one of the most interesting in the history of each society. Members of both societies are urgently requested to attend. All dentists are cordially invited to be present. Every one should bring models, specimens, appliances, or anything that may be of interest to the profession.

LOUIS OTTOFY,

Secretary Illinois State Dental Society, Chicago.

W. O. KULP,

Chairman Executive Committee Iowa State Dental Society, Davenport, Iowa.

THE DENTAL SOCIETY OF THE STATE OF NEW YORK.

THE above Society will celebrate its twenty-fifth anniversary with a three days' session, Albany, May 10, 11, and 12. The usual number of essays and discussions by prominent men in the profession, historical reminiscences, etc., together with a dinner, will constitute the programme.

It is intended to make it rather a social than a scientific meeting, and it is hoped that a large number of the profession, both in and outside of the State, will be present. For any information regarding the meeting, address the Secretary, Charles S. Butler, Buffalo, N. Y.

MASSACHUSETTS DENTAL SOCIETY.

THE Twenty-eighth Annual Meeting of the Massachusetts Dental Society will be held in Huntington Hall, Institute of Technology, Boston, on Thursday and Friday, June 8 and 9, 1893. The Society will have as its guest Professor Harrison Allen, M.D., of Philadelphia, who will give an address on this occasion; and other prominent men are expected to participate.

Members of the profession are cordially invited to be present.

Per order of Executive Committee.

EDGAR O. KINSMAN,

Secretary of Society.

CAMBRIDGE, MASS.

THE International Dental Journal.

VOL. XIV.

JUNE, 1893.

No. 6.

Original Communications.¹

ANÆSTHESIA, AND THE USE OF A NEW ETHER- INHALER.²

BY J. E. WAITT, D.M.D.

MR. PRESIDENT AND MEMBERS OF THE AMERICAN ACADEMY OF DENTAL SCIENCE,—It is with a feeling of diffidence that I come before you to-night to say a few words on a subject that ought to be familiar to each and every one of you, and yet, from personal observation and the special study of the subject for nearly ten years, I am confident that very few of us are perfectly at home in the use of ether, which, since its discovery and first introduction in 1846, has done more to alleviate the sufferings of humanity than all the other discoveries combined. It is a fitting tribute to Dr. Morton that I quote right here an abstract from an account of the "First Capital Operation under the Influence of Ether," by Daniel Denison Slade, M.D., published in the October, 1892, *Scribner*.

Dr. Slade was present at the operation and graphically describes the scene. (Dr. W. T. G. Morton, referred to in the following article, was a Boston physician. He was the first to introduce the use of sulphuric ether, and his first experiment took place at the Massachusetts General Hospital, in October, 1846.)

¹ The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

² Read before the American Academy of Dental Science, January 4, 1893.

"As all eyes were now fixed upon the scene before them, Dr. George Hayward stepped forward and remarked that, with the advice of the other surgeons, he should allow Dr. Morton to administer an article by inhalation to the patient upon whom he was about to operate which, it was alleged, would prevent any pain being felt.

"Thereupon, Morton, a man of commanding figure and appearance, very erect, and dressed, as he usually was, in a stylish fashion peculiar to himself, consisting of a blue frock-coat with brass buttons, a large and elegant scarf which completely filled up the open front of the waistcoat, 'gaiter' trousers, etc., and bearing in his hands the instrument already described, came from an adjacent room, and advancing to the operating-table, spoke a few words of encouragement to the patient and instructed her in the method of inhaling. The curiosity on the part of all present was intense. The stillness was oppressive, broken only by the hurried respiration and occasional sob of the patient. Grouped about Morton, standing as the central figure at the head of the operating-table, were the surgical and medical officers of the institution, as also the attendants, all as intent upon the unusual scene before them as were the most untried spectators in the seats of the amphitheatre.

"In three minutes the patient was completely under the influence of the preparation, as shown by the complete muscular relaxation, the drooping eyelids, the immobile pupil, and the death-like insensibility to external impressions.

"The operation completed, and even before the removal of the patient from the room, the profound stillness and suspense which had hung over all present were broken by loud murmurs of surprise and admiration at the success which had been attained. Morton was the hero of the hour, and was regarded with feelings akin to those which might have been awakened had an angel appeared, bearing the waters from 'the Lethean streams of oblivion,' which having been administered to the suffering invalid, had produced the effects witnessed."

From that memorable Saturday, November 7, 1846, to the present day, there have been discussions as regards the best method of administering ether and the after-result upon the patient, especially after laparotomy, where it is positively necessary that the patient should recover quickly from the effects of the ether without the retching that so commonly follows.

To go over the different forms of apparatus for the administering of ether would take too long a time, but I can safely say that up to within a very short period there have been none devised but re-

quired a great amount of ether in their use and failed entirely in the three important factors of an inhaler as the medium in administering ether,—viz., rapid anæsthesia, anæsthesia easily retained, and by a minimum of ether; then a rapid recovery without its attendant evils, retching, sickness, and headache.

About five years ago I introduced an inhaler, called the Packard inhaler, to the medical and dental profession, which at that time, and even to-day, is the best form of inhaler that can be used in administering ether in the old way. I need not give a description of this, as I will pass one around, and you can see the advantages over the old towel or paper cones and that most miserable of all, the sponge.

In the new Packard inhaler which I present to you this evening you will see the result of many years' study and experimenting, and in it a means of safely, economically, and pleasantly administering ether. It involves an entirely new principle,—namely, anæsthesia with etherated air.

It comprises an ordinary face-piece, such as is in use with the gas apparatus of to-day; to that part which contains the shut-off is soldered a shoulder, for the attachment of a rubber sponge-bag, in the top of which is placed a slide-ring valve; through the side of the inhaler is passed a tube, with the inner end bent so as to enter the bag. A graduated bottle holding four ounces contains the ether. This bottle is fitted with a screw cap, which has fastened through the top two tubes, one passing to the bottom of the bottle and the other just entering the cap; each tube has a slip-joint so made that the rubber tubes which are fastened to them are securely held. An ordinary thermo-cautery bulb completes the inhaler.

Attaching the parts, as you will see, then compressing the bulb, air is driven through the ether, thereby becoming thoroughly etherated; this is then forced into the bag of the inhaler, and from thence to the patient.

This seems a complicated form, but by a practical test of but two or three inhalations you will see that it is very simple. The advantages are numerous. First, no ether comes in direct contact with the patient's face or skin, therefore all burning of the face and eyes is avoided. Secondly, as the ether vapor is wanted just so fast is it made, thereby saving all evaporation of ether and saturation of the surrounding atmosphere with its disagreeable fumes.

The results of over one hundred tabulated administrations show that the average amount of ether required to produce surgical anæsthesia was three drachms, and for each hour's consumption two

ounces. The average time of inducing complete anæsthesia, five and one-half minutes; longest time, nine minutes; shortest time, two and one-half minutes.

The recovery is rapid, exceedingly so; many patients are conversing with the operator or nurse in three minutes after the inhaler is removed from the face.

Possibly a few words in regard to the best way of using the inhaler will clear away some doubts. This method I find the most satisfactory.

DIRECTIONS FOR USE.

1. Place from two to four ounces of ether, according to the estimated duration of the operation, in the bottle.

2. Place the hood over the patient's face, looking carefully to see that it fits air-tight about the chin and over the nose.

3. See that the air-valve on front of metal hood is wide open.

4. Compress the air-bulb very gently, just enough to drive a few bubbles of air through the ether.

5. At the end of the first minute close the air-valve.

6. Gradually increase the rapidity and force of the bulb compressions. One moderate compression with each inspiration is sufficient in the first stage.

7. As the patient approaches the second stage of anæsthesia, make two compressions of the bulb with each inspiration.

In from six to eight minutes the patient will be completely anæsthetized, with the consumption of from two to six drachms of ether.

During the progress of anæsthesia the air-valve can usually be kept partly open. At any time, in case of coughing, choking, or obstructed respiration, the air-valves should be partly or wholly opened.

Two and one-half ounces of ether should suffice for each hour of anæsthesia.

DON'TS.

Don't attempt to etherize a patient with the stomach full.

Don't use old ether which has stood in a warm closet or in an imperfectly-stoppered bottle.

Don't use anything but Squibb's four-ounce cases of ether.

Much of our success as anæsthetists depends upon our manner with our ether patients. We should see the patient a day or two before administering the ether, and in a quiet talk tell him of the peculiar features connected with its administration.

To be successful, circumstances must be brought under our con-

trol as much as possible, the patient in a submissive frame of mind, willing to yield entirely to us.

If a patient is frightened or roughly handled he naturally rebels, and the process is necessarily prolonged and therefore imperfect.

Children and adults of impressible natures are more easily overcome than patients of a vigorous intellectual character. Will may delay the progress of anæsthesia, and minds trained in reasoning will retain consciousness much longer than if less happily organized.

Ether should be administered three or four hours after meals, with the clothing in a loose condition at the neck and waist, and the patient in a recumbent position or nearly so.

In administering ether the eyes of the patient should be covered at the beginning of the inhalation; this precaution shuts out external observation and hastens the period of insensibility.

It is also advantageous to have the attention of the patient diverted by counting slowly one, two, three, and so on, following the lead of the administrator. The expiratory effort by so doing is followed by corresponding inspiration, which assists materially the full inhalation of ether.

Few patients can count as high as twenty-five or thirty without feeling the effect of the agent, and scarcely any one can reach sixty or seventy before becoming unconscious.

The best tests for the proper period for operating are insensibility of the eyeball to the touch, non-contraction of the pupil on the sudden exposure to light, and the general muscular relaxation.

The ether may now be withheld or pushed to any desired extent.

The unconscious occupation of the mind by counting is far better than coaxing a patient to try and go to sleep, which, under the circumstances, is very difficult.

In administering ether the pulse and the breathing should be closely watched. If the pulse be strong, the patient is doing well; if it becomes feeble, the ether should be withdrawn and the access of air permitted. When mucus collects in the mouth and throat it must be removed at once by a wet sponge or by carrying the finger back of the retracted tongue and drawing it forward.

One more word and I am done, and that is concerning the after-treatment of our patients. They should never be left alone or unwatched until they have regained consciousness, or until the respiration, circulation, and color of the skin have been fairly established.

Frequently anæsthesia is followed by prolonged sleep, particularly in young patients. This may be overcome by bathing the face in cold water.

Fortunately, however, looking at the great number of cases in which ether is given with perfect impunity, accidents are very rare; so rare, in fact, that when they do occur it is a question whether they were the result of administering the ether or from some other cause.

EXPERIENCES IN TREATING CLEFT PALATES.¹

BY DR. J. ADAMS BISHOP, NEW YORK.

I do not expect to-night to give expression to anything that is new or even to interest some of you in this matter, but only to give a *résumé* of my experiences in treating cleft palates.

It is unfortunate to be born with a life-long deformity, especially for a highly-sensitive person. Disease and deformity come upon the rich and poor alike, and to whatever position they may be born, they feel this burden which they have to carry through life. The rich seek and pay for something that will conceal their deformities, while the poor show theirs in the amphitheatre and by the wayside, that they may receive, from those who can pity them, a small sum of money.

Deformities are not new, but have existed for centuries, and men of education and science, all along the line of these years, have given to us their experiences, which help us in the dental profession to stand well in what is called advanced surgery.

The chief object of the operation for cleft palate is, of course, the improvement of the voice.

Suppose we begin back in 1500 and come down to our day in the chronological order (as may be found in Coles on the "Deformities of the Mouth") of such surgeons and dentists as have given a thought or appliance for the remedying of the cleft palate.

"1552.—Hollerius, in his 'Observ. ad Calcem de Morbis Internis,' proposes to stop the apertures with wax or sponge.

"1565.—Alexander Petronius, in his 'De Margo Gallico,' proposes, when there is but one opening in the palate, to stop it with wax, cotton, or a gold plate, taking care to give to the instruments the same concave form as the roof of the mouth.

"1579.—Ambrose Paré, in his book on surgery, published in Paris, and in the year 1649 translated into English by Thomas

¹ Read before the New York Odontological Society, March 21, 1893.

Johnson, proposes that the cavity should be covered over by a gold or silver plate 'made like unto a dish in figure, and on the upper side.'

"1649.—Isaac Guillemeau, in his 'D'Ouvres,' gave a drawing of an instrument similar in form to Ambrose Pare's instrument, but suggested that, as it was not always possible to adapt the plate perfectly to the roof of the mouth, a lining of sponge or lint should be applied, in order to render the closure more complete.

"1653.—Amatus Lusitanus, in his 'Curat. Medic. Centur.,' mentions a boy with diseased cranium and perforated palate, whose voice was restored by means of the gold plate and sponge.

"1685.—Nic. Tulpius, in his 'Observat. Medici,' mentions the same mode of treatment.

"1715.—Garangeot, in his 'Treatise on Instruments,' is the first that we find making any step in advance of his predecessors with regard to the construction of obturators. Describing one, he says, 'This instrument has a stem in the form of a screw, upon which runs a nut. To make use of it, take a piece of sponge, cut in the shape of a hemisphere, with a flat surface; pass the stem of the obturator through the sponge, and fix it by means of the nut. Dip the sponge in water, squeeze it dry, and introduce it through the aperture.'

"1723.—Fabricii Hieronimi, in his 'Chirurgicis Operationibus,' recommends sponge, lint, or silver plate, not suggesting any new form of instrument. He is the first, so far as I have been able to examine these old works, who makes specific mention of congenital cleft palate in contradistinction to accidental cleft or perforation.

"1734.—R. Wiseman, sergeant-surgeon to King Charles II., in his *chirurgical treatises*, gives evidence of having bestowed much thought upon the treatment of the defects of the palate, though he cannot be said to have made much real and practical progress. His novelty in treatment consisted in filling up the cleft with a paste composed of myrrh, sandarac, and a number of other ingredients. His idea was certainly in advance of his time, for by this means a most important end was gained,—that of perfect exclusion of air by its complete adaptation to the margins of the cleft. We are, unfortunately, not informed how this 'paste palate' was kept in position.

"1739.—Heister, in his 'Institutions of Surgery,' suggests the use of 'a gold or silver plate adapted to the perforation, and furnished with a handle or small tube, which, being armed at the top with a sponge, he may thereby exactly close the perforation.'

"1754.—Astruc, in his 'Treatise on Syphilis,' makes the first mention that we have of a silver button to the metallic obturator, in place of the sponge, in order to avoid the unpleasantness arising from the absorption of mucus. This is the first time that the unpleasant feature of the mucus has been mentioned. I will refer again to this later.

"1786.—M. Pierre Fouchard, in his 'Chirurgien Dentiste,' gives an account of some instruments which show a very great improvement on the forms previously in use; the sponge, as a means of support to the obturator, being substituted by an arrangement of metallic wings, worked into proper position after introduction into the cleft, by means of a hollow stem and nut, which, when screwed down, kept the wings (covered with soft sponge) across the aperture.

"There are descriptions given of others on the same principle, and of one on a then new plan, depending for its support upon ligatures round the canine teeth.

"1820.—The next advance was made by M. de la Barre, who is the first to mention the use of 'elastic gum' in the restoration of the velum and uvula. The artificial palates designed by this gentleman were ingenious in the extreme, but of such a complicated nature that none but a man of considerable mechanical genius could ever hope to be successful in their application. Still, we must bear in mind the great step taken towards the present instruments in use by the introduction of 'elastic gum.'

"1828.—I now come to a consideration of the artificial palates constructed by Mr. Snell, who arrived at much more satisfactory results in his method of treatment than his predecessors could have done, from the fact that he first obtained an accurate model of the mouth, on which he mounted and fitted his obturator,—a point that up to this time is not mentioned, even if it were practised.

"'My method,' he writes, 'of constructing an obturator is with a gold plate accurately fitted to the roof of the mouth, extending back to the os palati, or extremity of the hard palate, a part of the plate about an inch in length being carried through the fissure.'

"A piece of prepared elastic gum is next attached to the posterior part of the plate, where the natural soft palate commences, extending downward on each side as low as the remaining part of the uvula, and grooved at its lateral edges to receive the fissured portions of the velum. A movable velum is placed in the posterior centre of the elastic gum.

"It is requisite here to mention that the elastic gum should be

placed in a gold frame, and not merely fastened to the posterior part of the plate, as it would shrink up by remaining in the mouth. This frame should pass round its edges only, leaving the centre open. The anterior lateral edges should be made to come considerably over the sides of the fissure, which will prevent their slipping behind it during their altered positions, the whole apparatus being held up by elastic gold springs round the teeth on each side.'"

After seventeen years' study of the above and all that had gone before, Mr. Stearns, a surgeon, of London, in 1845 communicated four articles to the *Lancet* on congenital deficiency of the palate, when he gave a description of an instrument which he had contrived for the treatment of these cases. It was in some respects like the obturators of De la Barre and Snell, though more difficult to construct than either of them. It consisted of a gold plate fitted across the hard palate, having attached to it, by means of two spiral springs, an artificial velum of elastic rubber, consisting of a body, wings, and grooved edges to receive the margins of the cleft. I shall refer again later to Mr. Stearns.

"1857.—Mr. Sercombe, who had for some time paid a great deal of attention to the treatment of the cleft palate, in this year gave a description of the instrument he uses in remedying this defect, in a paper which he read before the Odontological Society, entitled 'Cleft Palate: Its Surgical and Mechanical Treatment.'

"In 1862, Mr. Williams exhibited the following case, showing his mode of treatment: Case of complete fissure of the hard and soft palate, the fissure extending through the whole of the hard palate and uvula.

"1864.—In this year Dr. Norman Kingsley, of New York, brought before the Odontological Society of Great Britain a method of treatment that for its merit demands the highest praise. The instrument itself was not altogether new in form, being to some extent very similar to that which had been constructed some years before by Mr. Stearns.

"The interest attaching to the paper was rather the account of the *modus operandi*, which was briefly mentioned, the two great novelties in Dr. Kingsley's treatment consisting in taking an impression of the parts in plaster of Paris instead of wax, and preparing the elastic rubber vela in metallic moulds, rendering duplication of them a very easy matter.

"1867.—Mr. George Parkinson, in a communication to the *Lancet*, describes his method of treating cleft of the hard and soft palate, which I will not detain you to repeat.

"Next we have an obturator made by Dr. Suerson, of Germany, entirely of hard rubber. A gold medal was presented to this gentleman, on account of his invention, by the Central Association of German Dentists.

"I have endeavored, briefly, it is true, to trace, from the first accounts given, the successive stages by which we have arrived at the present mode of treatment, showing the development of the principle that the obturator should not simply fill up the gap in a cleft palate, but be so constructed as to work on physiological principles with the natural movements of the sides of the cleft.

"In 1844 Sir William Fergusson demonstrated the precise action of the muscles of the split palate; and in 1845 Mr. Stearns gave to the profession an account of an instrument which, from the movements it was capable of, I am led to conclude was constructed with a view to utilize the peculiar muscular action which the year before had been shown to exist by the first-mentioned gentleman.

"This may have been simply accidental, but it is worthy of note."

Dr. Stearns's life commenced about eighty years since, badly handicapped by a deformity of the palatine fissure (with very little, if any, hope of being helped by the surgeon or dentist), and few of our dentists know with what skill and perseverance he struggled to overcome the difficulty which beset his life. His great aim was to perfect his speech and remove this great impediment. Without power to perfect his thoughts in a clear, pure tone, either in his family circle or in the refined and cultivated society which surrounded him, we can well imagine the mortification which led him to choose a life of scholarly habits, and devote much time to study and invention, in the hope of finding some remedy for his misfortune.

At twenty a graduate of Yale, at twenty-three he had a medical diploma, and five years later was in London, presenting to eminent medical authorities there his methods of correcting cleft palate with mechanical appliances. Eminent men in Paris and London recognized his achievements, and advised him to make a specialty in medical practice. This was in August, 1845 (*vide* London *Lancet* of that month). Dr. Stearns was able to put himself on record in this department at this early date in the use of vulcanizable rubber as a material, and to him belongs the priority of this discovery so clearly that the dental profession made no claims to it in the compilation of its literature on this subject up to the centennial year of 1876. Dr. Stearns, however, early discovered that plastic surgery was but partially successful in treating cases

of palatine fissures by staphylorrhaphy, nor could ordinary surgeons do it at all by the new method, because incapable and unfitted by want of mechanical skill and experience to undertake the construction and introduction of such appliances. So he very wisely turned his attention to the dental surgeon as being better qualified to furnish the elaborate and difficult mechanism requisite to the wants of the cleft-palate patient. Hence, on his return to America, we find him offering the opportunity to dentists who might wish to perfect themselves in this important department of science, to consult him, at No. 95 Cliff Street, New York, for that purpose. A number of our dentists did avail themselves of this privilege, becoming thus more familiar with his plans and ideas, and have ever since been able to hold leading positions in this department.

His generosity in giving freely his hard-earned experience to the dental profession in the interest of unfortunate cleft-palate patients deserves our thanks and gratitude.

I would introduce here the first three cases in which I made use of an obturator made entirely of hard rubber.

1. In November, 1869, I placed in the mouth of a lady one of these obturators, which has been constantly worn to date. Models of the mouth and obturator were at the International Exhibition at Philadelphia in 1876, and a history of the case was printed in the *New York Medical Journal* in 1878. The obturator was made of hard rubber, and the former defect in the speech would not now be noticed under most circumstances. One peculiar feature of the case is that the lady always retains the obturator in the mouth at night, as well as by day, and claims that its presence greatly softens the air as it passes down into her lungs, though I cannot explain how that can be.

2. In October, 1871, a gentleman about fifty years old came to me, after he had availed himself of all the instruments introduced into the profession up to that time, and was therefore fully competent to judge of the worth of this one. He pronounced it the most comfortable he had used, and said that it enabled him to articulate with ease and distinctness.

3. Dr. Gurdon Buck, in his "Reparative Surgery," published in 1876, reports a case (folio 148) treated by me in October, 1874. In concluding, he says, "The plate, when finally adapted, was worn with much comfort, and the characteristic defect of articulation, which had existed in a marked degree, was almost entirely corrected."

I would now like to call your attention to four distinctive

features of this plate: first, the simplicity of its construction, which allows of its being made and adjusted in a short time, compared with a velum instrument; second, the plate being made of one piece, and having a good support in the mouth, sustains all the soft parts in the action of talking, eating, and drinking; third, the heat of the mouth has no effect on it as on the soft velum, which after being worn a month loses its form; fourth, another point in its favor is the ease with which it is kept clean, the finely-polished surface causing the mucus, etc., to pass off from it without remaining as it does on the soft velum.

Dr. Gunning saw these obturators, and was free to criticise them. His description of them can be found in his "Hard Rubber Appliances for Congenital Cleft Palate," published in New York in 1879.

There being no forward action whatever of the superior constrictor muscles, a rigid plate can be worn without intermission, not only in comfort, but with improved condition of the mucous membrane, which is covered in, and of the general health, the nose being as free for breathing as in a normal condition of the parts, while the plate also enables the wearer to utilize the muscles of the cleft velum. The palate is easily made, and, being of hard rubber, does not deteriorate in the mouth. It is not supported by any part of the cleft, and may thus be worn from early childhood without injury to the parts; in fact, its support may even lessen the cleft.

The plate, which is held up by the teeth against the hard roof of the mouth, extends up into the cleft and thence to the back of the pharynx near the tubercle of the atlas, the end being rounded to allow the sides of the pharynx to close during the act of swallowing. This extension into the cleft being spread out over the soft parts on each side, the ununited muscles draw up against it and close off the nasal cavity. The vowel sounds are therefore preserved from the resonance of the nose by the natural action of the muscles, while the nasal sounds are used when necessary, and the tongue is able to form all the lingual consonants, the stiffness of the hard rubber affording the best possible substitute for the muscular firmness of the natural soft palate. To apply this palate, a simple impression of the hard palate and teeth, as is usually taken for the setting of artificial teeth, is quite sufficient, the extension into the soft palate being made by fitting the gutta-percha pattern to the parts without subjecting the patient to the annoyance of obtaining a plaster impression of these sensitive and mobile organs.

This palate is consequently so simple that any accomplished dentist can apply it, and the patient is therefore comparatively independent.

Early use of this artificial palate prevents unnatural action of the tongue, such as attempts to close the cleft with the tongue when the latter should be free to act in articulation, whether in speaking or singing.

Although, as I think has been shown by the foregoing, these obturators are very simple and are of the least possible inconvenience, still I should not advise placing them in the mouths of children under fifteen years of age. In the first place, a child does not appreciate the great advantage secured by the improved speech, and is thus averse to even the slight inconvenience.

In the second place, the fact that the parts affected are constantly growing renders the insertion of the obturator a matter attended by considerable risk of interfering with the normal development.

In case of simple cleft of the soft palate, I am inclined from my observations to believe that staphylorrhaphy will accomplish nearly as good results as an obturator, and will, of course, do away with the inconvenience of a plate.

I know that there are surgeons in this city constantly performing this operation, and, I am told by one of them, successfully.

I had hoped to-night to give you the details of such an operation which was performed long ago, but the sensitiveness of the patient has prevented my obtaining all the information, so I shall have to leave it until some future opportunity.

ON CROWNS.¹

BY DAVID GENESE, D.D.S., BALTIMORE, MD.

CROWNING and fronting teeth, of which to-day's clinic was a practical demonstration, has been in vogue many years. Names of prominent dental practitioners have been from time to time associated with new ideas upon the subject, and I have only submitted for your consideration eclectic points culled from the different methods known to us to simplify our work, and used with greater ease to the patient, precision in adjusting, natural appearance, and

¹ Read before the Odontological Society of Pennsylvania, April 8, 1893.

lastly, though not the least, with less destruction to the root and its organism.

My earliest recollection of this class of work is a natural tooth-crown, drilled through and countersunk like the Bonwill, affixed to the root by a leaden pivot pressed into the root, previously shaped to hold the lead, which pressed through the natural tooth and was hammered tightly in its place.

Work of this character is illustrated by specimens presented by me to the Maryland University.

The introduction of porcelain teeth produced a marked improvement in this branch of dentistry, and brought to us many methods of crowning, such as the Howe, Gates, Bonwill, Ryneer, and numerous gold-crown systems. The latter I leave to the good judgment of the admirers of a natural appearance in the mouth to decide their merits. A free edge near the gingival border is objectionable, while the destruction of the attachment of the gum margin to the root is a serious defect.

What I endeavored to obtain by the method shown to-day is conservation of the root with its marginal covering, also to avoid the necessity of reaming or drilling the pulp-canal to a given size to fit a pivot already formed irrespective of the conditions that might be found, and to adjust a bifurcated pivot so exactly that no undue strain should be the result to cause irritation after the crown was in place, and to have the pivot so under control that should a curve be in the root it will adapt itself to it, avoiding that distressing cause of so much trouble in pivoting,—pressing the sides of the root into the alveolar process, with its train of troubles.

To the gentlemen who were not at the clinic I would briefly state that these crowns are made to conform as nearly as possible to the natural roots found in a number of models, with sufficient porcelain left on them to allow for grinding in any direction, their density permitting them to be repolished.

A cup of irido-platinum is burnt into them, which has a head pressed upon it to prevent pulling out. It can be subjected to heat sufficient to melt pure gold without fear of cracking, as the tubular form allows it to shrink indefinitely, making at each firing a tighter hold on the platinum lining, as shown in specimens passed around.

The pivot is of the same platinum, formed from the sheet, and left hollow to allow for fitting into the canal its entire length. This can be kept hollow by plugging with asbestos or made solid by drawing the solder into it by the flux.

By this system you will see that the pivot and crown are inde-

pendently fitted to the root, and when soldered will occupy exactly their relative positions to each other, requiring very little cement to hold them in place.

Apart from this, each step of the work is under close inspection with mirror and models and by the point of instruments to detect any overlap, and the extra length of porcelain allows for grinding, fitting, and placing the crown at any angle independently of the pivot.

The soldering process is rendered safe and simple by the use of the little holder of pin metal and Teague's investing compound, as shown in specimens, which holds the post and tooth in position. The flame should be directed well onto the body of the tooth in soldering, rendering it the hottest part when solder flows, and the specimen in sections will demonstrate the union of tooth and pivot.

The higher the standard of solder used the better the result, as platinum cannot be properly soldered with poor metal.

Pure silver or gold or 18-carat plate gives the best result.

For accuracy of adjusting, models are taken after the root is prepared; the crown is fitted and articulated, and tried in its place, the hollow is filled with Parr's wax flux, which prevents grit from the wheels or any substance being in the platinum cup that might interfere with soldering. The pivot in its place, and the crown already proved correct, warm the wax and adjust to position, then cool. When withdrawn, invest as shown by model and solder. Ten minutes after, the crown is ready to place in position.

The usual precaution of sealing the apex and drying the canal is needed. Gutta-percha is good in some cases, but I prefer fossiline, imported from Europe. It wears well, is a safe and easily-worked oxyphosphate, not setting too quickly, very adhesive and durable, while its chief advantage is intense hardness soon after fixing, and retaining its density, though mixed thinner than most of its similar compounds.

In finally adjusting the crown I place a wooden point on the automatic hammer and tap it a few times, forcing the crown to its closest adaptation and driving off the excess of cement.

It sets hard enough in ten minutes to allow grinding the crown, should the articulation require it.

If hurried from any cause, these crowns can be set by this cement without soldering, and will last several months. To those who prefer banding, this crown presents the strongest air-tight collar; no possibility of fluid entering between the metal and tooth, and the least amount of gold showing, as the edges are made flush with porcelain, as shown in specimen.

CORRECTION OF DEFORMITIES OF THE ORAL REGION.¹

BY ALBERT WESTLAKE, D.D.S., NEW YORK.

IN October, 1892, while on a professional visit in the West, I was requested to consult with a lady in regard to a deformity of the oral region.

The history of the case is as follows: In 1870, Mrs. X., aged sixty, through the indiscretion of her husband, contracted syphilis. She first complained of soreness in the region of the nose and malar bones, and an itching and pain in the hard palate. Subsequently the turbinated, vomer nasal, and palate bones were removed. The result, after twenty years, is represented in Figs. 1, 2, and 3. As is often the result in such cases, she was addicted to morphine for a long period, but at this time, the disease having been arrested, the habit is entirely overcome.

I hesitated to attempt her case, it having been pronounced by eminent dentists in her city as beyond remedy. The only remaining three teeth on the upper arch were shells, except the right bicuspid, although the roots were firm.

The successful adaptation and use of an artificial denture would apparently depend on the support of these teeth.

She came to New York, however, and I succeeded in cleansing and filling the root-canals, and fitting gold caps over each tooth, and soldering them together, making a perfect union. They were closely fitted under the gingival margin of the gum, and, being highly polished, were comfortable and perfectly aseptic.

I next fitted an upper denture, which closed the opening in the hard palate and articulated naturally with the lower teeth.

In the adjustment of a nose I followed a plan I had heretofore used in such cases.

First taking a plaster cast of the head (and in the case of this patient being aided by an old photograph), I succeeded by a careful appreciation of the general facial contour in preparing a preliminary nose in wax. This is made as near as possible in color to the complexion, so as to secure the proper blending of shade and expression. When satisfactory to my patient and myself, I made an aluminum cast, about a line in thickness, and in weight not exceeding four pennyweights.

¹ Read before the New York Odontological Society, March 21, 1893.

FIG. 1.

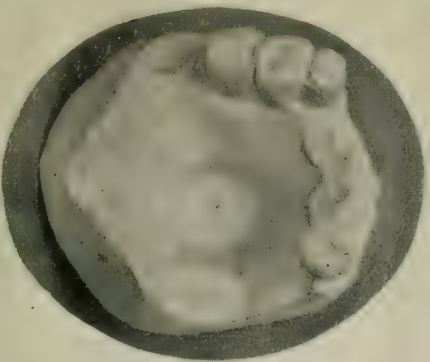


Exhibit of model of jaw.

FIG. 2.



Exhibit from photograph before operation.

FIG. 3.

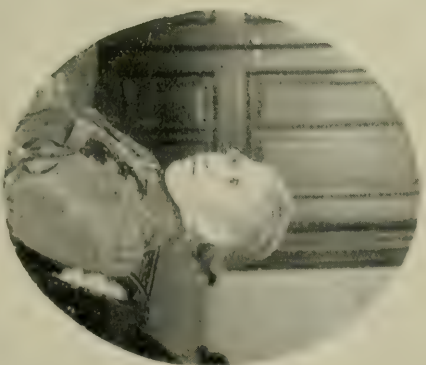


Exhibit from photograph after operation.

Over this I painted the flesh enamel, being a preparation of wax, gum-arabic, gutta-percha, etc., which resembles closely the translucency of flesh, and is not affected by ordinary thermal changes. After the nose was thus prepared and adjusted to the face, I was fortunate in securing the services of Mr. Constant Thys, the artist in charge of the Eden Musée, who imparted the life-like appearance, blending with the complexion so closely, even to the wrinkles, pores, and veins, as to challenge detection.

The main difficulty was then presented in securing the nose to the face. I overcame this, after several trials, by fastening a bar of gold and platina to the inner ridge of the nose and passing it down at a carefully studied angle through the artificial denture. Various devices were tried to secure the bar after passing through the plate.

I found that although a nut and triple thread would work well when I used the forceps or a specially prepared holder, yet the patient found it exceedingly awkward. I also rejected the plan of securing the bar by a spring nut similar to those used in French clocks, fearing that if it suddenly loosened the patient would swallow it.

I finally decided and adopted—and much to the pleasure and comfort of my patient—the simple extension on the plan of a blade and spring in a pocket-knife. (I was assisted in its construction by the W. F. Ford Surgical Instrument Company.)

As the nose was placed on the face and the bar passed through the hole in the plate, she could, by simply pressing the extension, spring it tightly in a groove in the plate, and as easily remove it.

The nose when adjusted is represented in Fig. 3. The only apparent joining that can be noticed is immediately below the junction of the eyebrows, and this is not visible when the patient wears glasses.

Spectacles are not necessary to the adaptation of this nose. In masticating there is no movement of the nose.

In a recent case, presented to me by Dr. Charles McBurney, surgeon to Roosevelt Hospital, I was enabled to secure the artificial nose with the aid of gold bars and rubber attachments, but consider the additional bracing by spectacles advisable in most cases. Where special arrangement is required, I have been aided in their adjustment by Mr. W. E. Duncan, of E. B. Meyrowitz, opticians.

As shown in Fig. 2, there was a partial destruction of the soft palate.

As our authorities state, and as we well know, this organ is an

important factor in the perfection of human speech. The voice, as it issues from the larynx, is modified in tone and character and interrupted in its passage by certain organs, the most important being the velum palati. This acts as a curtain, directing all the sound at times through the mouth, and again, combined or entirely, through the nasal passages, by being in firm contact with the dorsum of the tongue. The soft palate, in conjunction with the muscular wall of the pharynx, must be under active control to secure the purity of speech. A certain indistinctness of utterance follows where the soft palate is deficient or deformed (as often found after operations of staphylorrhaphy, when the newly-formed septum is rigid, tense, and deficient in length), or the pharyngeal walls are paralyzed or inactive.

Although the velum lost in this case is not very extensive, requiring only an obturator less in size than a pigeon's egg, yet I was unable to fit it with comfort, owing to the gagging or apparently suffocating sensation it caused. The restoration of speech to this patient is remarkable. The improvement is marked in the vowels and diphthongs, because the plate covering the aperture in the hard palate allows the resonance in the buccal cavity—where all vowels are made—and closes the abnormal communication with the nasal cavity. The physiological action of the nares and nostrils is, of course, important for the production of purity in speech, and and as this nose is mechanical, there remains imperfect sounds which practice will hardly overcome.

The patient, at my suggestion has commenced lessons in elocution. I have advised the study of the French or some foreign language, mainly to divert the mind from the forced habit of speaking her own vernacular badly.

The faculty of fairly perfect speech is, in most cases, more easily acquired in accidental lesions than in congenital clefts. A well-known and recent authority on the deformities of the oral region says, "The attempt at the replacement of a nose may be regarded as exceptional for the reason that it is so conspicuous an organ that the appearance is of more consequence than utility. There is no organ in the entire economy the loss of which creates so hideous a deformity as the nose, nor is the successful prosthetic restoration of any organ so difficult.

"Artificial teeth, eyes, legs, hands, arms, etc., are all made so skillfully as to escape detection, but artificial noses, never. The best of them, however artistic or appropriate in form, are but poor imitations of adjacent living tissue."

This complete assertion was in mind when my first attempt in this specialty was commenced, but as a result of careful investigation and study, and the enamel preparation used, together with the artist's treatment, and the light-weight metal, has enabled me to produce results which have been pronounced by some of our eminent surgeons as remarkable.

It was my desire to present several other cases to you this evening, but I have not been able to complete them in time.

This plaster model shows a remarkable congenital deformity of the ear. The patient is a splendidly-developed lad of twelve years. The ear on the right side is beautifully formed, as you will observe by this other plaster model.

Several weeks ago, Dr. Charles McBurney made a very skilful operation, opening through this stub close to the skull, giving me a slit half an inch long and very strong, to which I shall attach the ear made of similar material to the nose.

I have several other cases, including replacement of nose and malar bones, of entire bridge of nose and of inferior maxillary, which I shall be pleased to present to the profession if they so desire.

WHAT ARE THE BEST MATERIALS TO ENTER INTO THE COMPOSITION OF TEMPORARY FILLINGS TO BE RETAINED FOR A MINIMUM OF THREE YEARS?¹

BY L. ASHLEY FAUGHT, D.D.S.

IN the discussion of this question it is of first importance to understand alike and aright the meaning and use of the term "temporary." The word is defined by Webster as "lasting for a time only; existing or continuing for a limited time." In dentistry, its use as applied to filling-material is to express all that is opposed to the meaning of the term "permanent," and the testimony of practical experience is that quite frequently fillings, inserted with the idea of their permanency for a minimum of five years, often prove evanescent and fail of their purpose long before the expiration of that period. What is true of carefully-inserted work is found to be

¹ The remarks made at the February meeting of the Odontological Society of Pennsylvania by Dr. Faught were condensed in the regular report. At his request, and in justice to him, they are here presented in full.—ED.

not less true of service rendered with the idea of even a minimum of three years. The speaker therefore conceives that it is impossible to speak of any filling as being either permanent or temporary, since varying conditions render it impossible to name with scientific accuracy the limited time of its continuance. It is time that the profession of dentistry ceased the use of the words temporary and permanent as related to filling-materials, except possibly as the word temporary is used, according to the definition of Dr. Ottolengui, to indicate a filling placed to cover dressings used in medication of the teeth, or inserted to tide over a few days until more convenient to fill, or to force the gums away from cavity borders, or for strictly temporary purposes. The treatment of dental caries by the insertion of filling-material is to restore lost tissue and to exclude deleterious influences which would irritate the pulp or contrive the destruction of the unnaturally-exposed soft tissue of the tooth. It is unscientific and absolutely impossible to prognosticate the duration of the efficacy of this service. Which of the many materials at our command should be used in any given case cannot be determined except by the operator after a careful consideration of the pathological conditions presenting and likely to surround the filling in its service. We may, as we have this evening, discuss with profit the chemical and mechanical qualities which any material has in itself to resist disintegration, but no statement can scientifically be made as to the length of time these qualities will remain inherent, when we add the element of their use under conditions of which it is impossible to know anything. These views are submitted not by way of cavil, or evasion, or criticism of the framing of the topic for discussion; but because, considering the fact that reports of these discussions are to become an epitome and consensus of the mind of the profession at the Columbian Dental Meeting, it is well not to give any foundation to the present too prevailing opinion of the public that fillings are warranted to last a specified time, as shoemakers guarantee a pair of shoes.

Reports of Society Meetings.

NEW YORK ODONTOLOGICAL SOCIETY.

A REGULAR meeting of the New York Odontological Society was held on Tuesday evening, March 21, 1893, at the New York Academy of Medicine, No. 17 West Forty-third Street, New York City, Dr. Woodward presiding.

INCIDENTS OF OFFICE PRACTICE.

Dr. Francis.—I hold here an appliance which I was requested to exhibit this evening. It is a lens that can be held attached to the finger. It is double-jointed, and can be turned in any desired direction. I had it made from a design of Dr. Williams, of Boston, and find it very useful when preparing and filling cervical cavities of the incisors.

I exhibit also an instrument designed as an amalgam plugger. It is very convenient for introducing amalgam, and I value it greatly. Here is another instrument which I once exhibited at a clinic of another society; it is a forceps for clipping the overhanging gum from inferior third molars. It may be slipped under the gum, and in an instant will clip out a small piece of that tissue nicely.

I have an incident of office practice which I think worth relating. A middle-aged lady came to me to seek relief from pain caused by a diseased second inferior bicuspid. Her face as well as her gum was very much swollen, and had been in that condition for some days. The tooth contained an amalgam filling on its posterior surface. I drilled through the pulp-chamber and cleansed the root as well as I was able, using peroxide of hydrogen, which caused bubbles to exude in great profusion. By making applications to the face and gum, I succeeded in reducing the inflammation and so rendered her quite comfortable, but the trouble soon after returned. I treated it again, and it once more seemed all right. In the mean time, she visited Washington and was absent some weeks, but had no trouble while away. This all occurred just previous to the time that Dr. Thomas, of Philadelphia, read a paper before this

Society on the extraction of teeth, and I then decided that if this patient had trouble with her tooth again I would advise its removal. This proved to be the case, and, at my suggestion, she went to Dr. Hasbrouck and had it extracted. He gave her the tooth to show to me. It was necrosed at the apex. There is an incident connected with this that I wish to state. The lady was under treatment for partial deafness. A few days ago she called on me and remarked, "My physician says that my deafness is fifty per cent. less than it was before I had the tooth out." Her aurist felt convinced that the presence of this diseased tooth had aggravated the disease.

I would like to state another incident, although not one of office practice. I want to tell you of a recent visit to Buffalo, that you may know how well favored our brethren are in that city. It has a new medical university, which is remarkably complete in all its appointments, and excellent provisions have been made for instruction in dentistry. In it is a magnificent infirmary as well as a laboratory, and everything is nicely arranged. The students are on the same footing with medical students; they attend many of the lectures together, and have free access to the clinics of the general hospital. I was much pleased with everything I saw there, and so concluded to report to you, to let you know how things are progressing in the western part of the State.

Dr. Howe.—I wish to endorse what Dr. Francis has said about the usefulness of the lens, supported on the finger adjustable support devised by our friend, Dr. J. L. Williams. I have one differing somewhat from Dr. Francis's, but made from a description given me by Dr. Williams. While it has some defects, it serves the purpose well.

I have found, in the use of a lens for magnifying work under the instrument, that a relatively low-power lens answers the purpose very well indeed, and has an advantage in not requiring one to be very particular about the focus.

Dr. Jarvie.—I am treating a case at present which may be interesting and may help others to diagnose similar conditions. A lady came to me three or four weeks ago with soreness in the right superior lateral and a small fistulous opening near the margin of the gum. The opening was a very fine one; the appearance of the tooth did not indicate a dead pulp, and the symptoms made me think the pulp was not dead; and yet I could not understand why there should be a fistula. The direction of the sinus indicated that it was connected in some way with the lateral. I examined the

tooth and could not find decay. With a fine instrument I worked up under the gum as far as I could. On the labial surface the gum clung quite close to the root, but I found when I worked an exploring instrument on the lingual side of the root the point of my explorer dropped into a cavity. I pressed the gum away with cotton, and when I had the cavity sufficiently exposed, I discovered that it was not caused by decay, but by absorption, the cavity reaching to the pulp. I filled the cavity with gutta-percha, hoping that the pulp would give no further trouble, but it did, and I determined to destroy the pulp. To that end I drilled a cavity through the palatine surface of the tooth until I got to the pulp, and then I applied creosote and arsenic. About ten days ago a spot appeared on the labial surface of the gum, about a quarter of an inch in diameter, looking somewhat like the common ulcerated surface that we see sometimes, and yet not exactly like it. The tooth was very sore, and in the centre of that little spot was a fistula. I discovered the other day that I could work through that and into another cavity on the labial surface of the root, also caused by absorption and also reaching to the pulp. The cavity was perfectly round, as though a small worm had burrowed in, but was much larger on the inside than at the opening. I have not explored it thoroughly, but a burnisher that I can just enter at the opening I can move in every direction upon the inside of the cavity. The cavity must be four or five times larger than at the opening. The tooth is perfectly sound so far as decay is concerned, and the pulp is alive. What has caused the absorption on corresponding points, one on the labial surface and one on the palatine surface of the root? I have never met with such a case before.

Subject passed.

The Secretary then read a communication from Dr. Walker, notifying the Society of the death of Dr. Frederick A. Levy, of Orange, N. J., and Dr. W. W. Allport, of Chicago, Ill.

Dr. Bogue.—I move a committee be appointed to express the sentiments of the Society.

The President appointed Drs. Bogue, Francis, and Jarvie as such committee, and instructed them to report at the next meeting.

The President then introduced Dr. Albert Westlake, who read a paper on "Correction of Deformities of the Oral Region," which he illustrated with various models and photographs. He also showed models of a case, which he is now treating, in which the ear is deformed.

(For Dr. Westlake's paper, see page 416.)

DISCUSSION.

Dr. Westlake.—After Dr. McBurney first operated I took charge. It has a slit a quarter of an inch long close to the skull. I have cast the ear, and have already made an attachment with aluminum, and a gold bar fastened through here holds it right in position. To remove it, a fine instrument is pressed on a point the size of the head of a needle, and it springs off readily. When the enamel is on, I think it will be a perfect adaptation. It was a beautiful surgical operation, and the result is very satisfactory.

Dr. Jarvie.—Was the piece detached entirely?

Dr. Westlake.—No; I will pass around the model, so you can see. This is the shape of the other ear, but in a smaller size. I have several other interesting cases in hand, including a nose and malar bone.

I have sketched this case, giving a general idea how it is fastened. This one is the case of a young woman who was caught in an elevator. She was treated at Roosevelt Hospital and referred to me by Dr. Towsey. This plate fits very accurately on the bridge of the nose, and is held by improved cement, but the glasses are used to hide the upper-junction glasses.¹ (Figs. 1, 2, and 3.)

When I agreed to read a paper before this Society, I had a number of cases under way, but have not been able to complete them for presentation to-night. One that I had last fall was published in the local papers. The description given was very interesting from a reporter's stand-point, and I expected the gentleman to be here to-night, but he has not come. I would have been pleased to have had him present on account of the practical demonstration of this method of correcting the deformities of the nose. It is a singular thing, but Dr. McBurney said he had never seen any deformity like the one which is represented here in the model, and yet the mother of this boy says she knows of five cases. Three have already written to me requesting a history of the case. I think the process a very simple one, the principal point being, of course, in the question of fastening. Dr. McBurney tried to bring the hair down in order to have it cover some of the defects which would naturally occur. In the daytime they look very natural, showing translucency of flesh. At night the change is hardly perceptible.

Dr. Howe.—Is the auditory canal absent in this boy's case?

¹ Mr. W. E. Duncan, of E. B. Meyrowitz, opticians, aided me in the adjustment of the special style of glasses needed.

Dr. Westlake.—Yes; there is no auditory canal whatever; there is a slight depression here, which I suspected might lead to an internal canal, but I found that the boy could not hear a thing by closing the other ear. When I placed a watch back of the ear, he could hear it, but that was by contact only.

Dr. Ottolengui.—I think that almost any appliance of a mechanical nature, constructed to hold an artificial organ, will eventually become useless, or at least inadequate. We can hinge a door to a house, but mechanical attachments to soft tissue is a totally different matter. Any impingement will produce absorption, resulting in an alteration of the soft tissue, which must modify the fit of the appliance. Dr. Westlake truly says that the problem of attaching the organ is the greatest difficulty. I therefore desire to narrate the history of a case which will prove instructive in this connection.

About three years ago a gentleman came from Europe to have Dr. Kingsley make him an obturator and a nose, the necessity for both having its origin in a syphilitic lesion. Dr. Kingsley hesitated to undertake the nose because of the difficulty of attachment, but the gentleman had already solved that problem for himself. He was at the time wearing a nose which had been made for him in Europe, which, though unsatisfactory from an artistic and æsthetic point of view, was nevertheless held firmly in place. The statement which I am about to make may be astonishing, but it is nevertheless true. This man used a sort of glue, or cement, for attaching his artificial noses. I cannot at this moment give the precise formula, but it is composed of tragacanth and one or two other of the sticky gums. Dr. Kingsley made for this man six noses, which he paints to suit climatic changes and effects of daylight and gaslight.

Dr. Littig.—I had the pleasure of seeing the finished case that was mentioned by Dr. Westlake, and I must say that the appearance and adaptation were as complete as I have ever seen. In fact, I do not doubt but that the party might walk into the room and a casual observer would not notice that the nose was artificial. The attachment was complete in the fact that there was no movement during mastication, it being attached to the plate, and the plate being fastened to the teeth, so it would hold perfectly firm. That the tissues may yield in the course of time I have no doubt; but the attachment that Dr. Westlake has with the spring, which will shut down closely, so as to hold the rod which fastens through the plate, I think will enable the patient to wear it a considerable length of time without alteration.

Dr. J. Adams Bishop then read a paper on "Experiences in treating Cleft Palates."

(For Dr. Bishop's paper, see page 406.)

Dr. Bishop.—I wish to say a word or two as an addenda to my paper of last month on fractures of the lower jaw. I felt that our colleges and our schools were not educating young men to treat that bone as it should be treated. The next week the *New York Medical Journal* had an article entitled "The Treatment of Fractures," by George W. King, M.D., of Montana. I will read one or two paragraphs from the paper:

"To know all the steps of an operation is one thing; to execute them in a masterly manner is another. Special training for the work is absolutely demanded in either case. There are very few cases strictly surgical that do not require the services of the hands as well as of the head.

"Division of labor is therefore an advantage, in that greater skill may be acquired by those whose work is limited to certain lines of practice. Naturally, the experience of one who treats but a single fracture in a year is not considered nearly as conclusive as that of one whose cases are numbered by the hundreds, and yet much may be learned from a single fracture, especially if it is complicated and turns out badly.

"Failure to approximate the fragments means months of suffering to the patient, a prolonged convalescence, and perhaps permanent disability. Look at the tremendous task imposed upon nature when a fracture remains unreduced. The fibrinous material, instead of exuding between the fractured ends, as it would do were they in apposition and kept quiet, must bridge over the intervening space at a great disadvantage. The only wonder is that union takes place at all."

The next Sunday morning I read in the *New York Herald* of February 26, 1893, the following:

"Michael McMahon, thirty-two years old, a carriage-builder, of Fordham, went to the Manhattan Hospital five months ago, suffering from a broken jaw. Necrosis had set in, and the bone had to be scraped while the patient was under the influence of ether. McMahon was discharged, but returned to the hospital in December, still suffering from necrosis. His jaw refused to heal, and at his own request McMahon was again operated on last Wednesday. Visiting Surgeon William V. Wilkie performed the operation, assisted by several other physicians. He was examined, and the heart, kidneys, and liver were found in a perfectly healthy condi-

tion. Ether was administered at 4.30; the patient was back in bed, unconscious, at five o'clock, and despite all the efforts of the physicians, he died at a quarter past nine. One of the surgeons said last night, 'We did all we could for poor McMabon; why he died we do not know.' Deputy Coroner Weston declared that the man died of shock from ether."

This is a case that happens to a man once in a thousand times, and is always a surprise to the profession. Dr. Carl stated in his paper in September that he only wanted fifteen or twenty days to cure a patient. This patient was in the hospital for five months and was not cured.

DISCUSSION.

Dr. Littig.—In the case of those obturators, do you allow them to rest above the fissure or below?

Dr. Bishop.—Above. The case I gave you shows that the fissure is below. Talking brings these walls of the fissure up solid against the plate. The gentleman has worn it without any inconvenience for a long time. This can be inserted in three days. It took Dr. Stearns two days to make that little delicate spring that I showed you.

Dr. Howe.—I was rather surprised to hear Dr. Bishop speak so favorably of the operation of staphylorrhaphy, from the dentist's stand-point. Regarding as we do the question of the restoration of speech, I supposed that when clefts in the soft palate existed, and they were brought together by the operation of staphylorrhaphy, that there must necessarily be a permanent deficiency of tissue, and consequently imperfect speech. It is not a great many months since a patient was brought here who lately had a perforation of the soft palate, just at the posterior margin of the hard palate. The opening was said to have been no larger than would permit an ordinary-sized lead-pencil to pass through. It had healed spontaneously, and the gentleman was brought here to have some one tell why his speech had become imperfect since the lesion had healed. I suppose that is an illustration of what is likely to take place in every case where staphylorrhaphy is a surgical success. Will Dr. Bishop tell us what his ideas are on this point?

Dr. Bishop.—That is very true. Like all operations, the first few weeks or months, or possibly years, the cicatricial tissue is very rigid. The case I gave you in my paper last month, which was a case of rhinoplastic surgery, where the median line involved the right eye and half of the nose,—when that person was first operated on, the mouth was so rigid that he could hardly get food

into it, but time softened it down. I cannot recall the surgeon who performed staphylorrhaphy, and was so disgusted that he afterwards took his knife and destroyed what he had done because he had not improved the voice; but if he had waited for a time I think there would have been a great improvement. This operation that I mentioned to-night was performed by Dr. David P. Smith, a professor in Yale College. He was surgeon on General Thomas's staff, and he performed it on a young man who was in Yale College. If we could only have a few months or a year for the patient to develop the parts united with the new tissue, I think we should get back the voice as well as though we had used an obturator, and would save the annoyance of an instrument. Of course, in a deformity of the mouth there is no instrument or operation that will make it absolutely perfect.

Dr. Westlake.—I appreciate the remarks of Dr. Howe in regard to the operation of staphylorrhaphy. I have heard similar reference made by some of our most eminent surgeons in New York, and they have all agreed that the dental profession has gained results when the operation of staphylorrhaphy has failed. With regard to the question of cicatricial tissue softening in time, I am pleased that such is the case. That muscles can be trained, I have no doubt.

In 1887 there was an operation—the excision of the inferior maxilla—reported in the *Dental Cosmos*. That operation was performed by Dr. McBurney at St. Luke's Hospital, where he was then surgeon. It was thought that by the application of a splint immediately after the operation the remaining jaw that was not injured could be kept in apposition, and it would be much easier to regulate the muscles on that side, and, in fact, all over the face. Dr. McBurney, through this case, has proven to other surgeons that it is necessary for the comfort of the patient and rapid healing, after an operation of that kind, to put a splint in immediately. That is where the dental profession has aided the surgical profession wonderfully. There has been no case ever reported where that difficulty has been overcome before. There is a cicatricial tissue where the excision was made at the angle of the ramus, which is very hard, and in nearly three years there has been no special softening of that tissue. The patient has had this apparatus (described in the *Dental Cosmos* in September, 1888) removed. The muscles were so trained that at the present time the patient has entirely overcome the retrograde movement. A lower denture is fitted in.

Dr. Bishop's valuable paper opened up new thoughts to me.

I question very much if the surgical profession will anticipate by the knife the benefit of well-adapted obturators. The operation of staphylorrhaphy, I believe, is obsolete, unless done very early in life.

Dr. Ottolengui.—The essayist, at the end of his paper, repeated the arguments of his predecessors, stating that we should not insert obturators in the mouths of children under fifteen years of age. I think, however, that I have seen the limit placed as low as twelve. I have come here to-night, attracted by the announced subject, to tell you what Dr. Kingsley has been doing of recent years for children between the ages of three and eight.

I pass around a model of a mouth of a child of six. Though so young, I will call her Miss S. When first seen she spoke so badly that only a little cousin, a playmate, could comprehend her meaning. She held no intelligible conversation with any one else, but communicated most of her wants by means of signs. That was eighteen months ago. Dr. Kingsley made an artificial soft palate, or velum, for her, and she was given a course of training by one who is a specialist in this sort of education. I saw the mother two months ago, and she informed me that whilst at Newport, last summer, little Miss S. was sent to school, and the teacher at that school called upon Mrs. S. to inquire what system of education had been given to this child which had enabled her to enunciate so well. There was no suspicion that there existed a deformity of any kind, but, on the contrary, it was remarked by this teacher, and by others, that the child's enunciation was uncommonly good.

In the next model you will observe that only the temporary teeth are present, little Miss C. being but five years of age. The temporary molar on one side was utilized after filling, but the fact that the molar upon the opposite side has been worn away to the gum line seemed to offer an insurmountable obstacle, as, of course, the plate which carries the velum must be attached to the teeth by clasps. Dr. Kingsley, however, suggested what I think has never been done before, and I crowned this temporary molar with gold,—no simple undertaking for a sensitive child of such tender years.

Dr. Kingsley then constructed his instrument, and about Christmas week of last year she was allowed to return to Boston. On January 1, or thereabout, the specialist before alluded to went on to Boston, and has been instructing the child daily ever since. In order that definite results might be proved, the child was made to talk into a phonograph, repeating a little child's poem which she had memorized, as she has not yet learned to read. When the phonograph repeats what was said at that time, one hears but a

jumble of meaningless sounds. Her special training course will terminate on April 1, but already she has been made to repeat the same poem to the phonograph, and I am informed that the result now is quite intelligible, though of course, in time, and from a continuance of her daily exercises in enunciation, she will eventually speak more perfectly. This, however, shows how much may be gained in three months, when the patient is young, and before the formation of bad habits of abnormal speech. The people in her neighborhood are quite surprised to discover that the little girl has "overcome her stuttering," as they called it, and persons afflicted with stuttering have applied to the parents to know how they may be benefited.

A word on the subject of the soft palate, or velum. With a record like that attained in the above cases, we must admit that there is an inherent value to the velum not to be hastily overlooked. Many of the objections which have been urged are well founded. The soft rubber palate is often nasty, and frequently not durable; but I have observed that, like other things, it is nasty in the mouths of nasty people, whilst it may be quite clean in the mouths of the cleanly. The shortest duration for one I find to be six months; and as the cost is five dollars for each duplicate, which is about the charge for a pair of shoes which lasts no longer, it becomes a question whether it is not worth as much to talk well as to walk well. But I know one patient who has worn a palate continuously for ten years without needing a duplicate, whilst many last from two to five years.

After a person who is afflicted with *congenital* cleft palate has learned to speak with a velum, a hard rubber obturator may be substituted, and will serve all purposes. This, I may say parenthetically, explains why some dentists have given patients obturators in place of soft palates which they had previously worn, and then have unctuously reported that the patients "liked the obturators best." All the greater difficulties had been overcome by using the flexible instrument.

Looking into the fauces of these patients, the sides of the divided palate hang inactive. Let the patient attempt to swallow, and the sides approach each other. The velum allows this play and encourages it, so that in time a greater activity of the muscles may permit the sides to approach even closer together. An obturator simply plugs up the hole, and it is evident that the fissure would never lessen with such an instrument in place. Place an obturator in the mouth of a child, and in five years there would be a space

all around the bulb, because the development of the child had naturally enlarged the cleft. But insert a soft palate, and the play permitted to the muscles will increase their mobility, so that the tendency towards enlargement, through development of the child, would be counterbalanced by the development of muscular activity, the cleft remaining as small as in the first instance. In proof of this assertion, I may state that a velum made for a child two years ago fits her to-day, and if any change is ever made, it will be to decrease the size of the flaps, to allow more play of the muscles.

As to staphylorrhaphy, the same rule holds. The earlier the operation is performed the better the result that may be hoped for.

There is a child who was brought to Dr. Kingsley at the age of three and a half years. The operation of staphylorrhaphy had been performed with exceptional success. Unfortunately, the anterior part reopened, but the posterior was so good that it seemed fair to give the child a chance to encourage the growth of the soft palate by inserting an obturator to close the opening in the hard. A little instrument was made for her,—a platinum clasp-plate carrying hard rubber,—and the usual course of instruction resulted in a marked improvement in speech. I hope that by this means the closed natural palate will acquire length and strength to perform its function.

Dr. Littig.—You mean that the instrument bridged the opening?

Dr. Ottolengui.—Yes, the hard rubber fitted over the opening and was held by the platinum plate. If the plastic operation had been a little more successful, and had closed the whole fissure, the child might have had a complete restoration, which would be due to the early operation.¹ It seems singular to sew up the harelip in

¹ Since making the above remarks, I have again seen the little patient for whom the obturator was made, and the present condition is interesting, as entirely refuting my hope in favor of staphylorrhaphy. When first seen, the posterior edge presented merely as a divided uvula, but with the development of the child during the three years which have elapsed, what was then seemingly a split uvula is now a distinct cleft palate, though of course smaller than it would have been had no operation been attempted. Nevertheless, it will necessitate the construction of a velum before perfect speech can be attained, so that the operation which looked so much like a success three years ago must now be counted as a failure, although there has been no tearing away of any of the cicatricial tissues. Another point of extreme interest is, that where the obturator was placed to cover the opening in the hard palate, the soft tissues along the edges of the fissure have grown so that they now nearly touch, and it is my belief that that opening could be easily closed by operation. This would be a benefit in simplifying the instrument needed and materially altering the tendency towards nasal resonance.—R. OTTOLENGUI.

infancy and to leave the palate till the tenth year. If the surgeons must operate, let them do so early, and we may get some record which would be encouraging to staphylorrhaphy.

Dr. Bogue.—I would like to ask Dr. Ottolengui if I understood him right, that one of these models is from a case where the instrument was placed two years ago, has been worn since then, and that he has seen it since.

Dr. Ottolengui.—Yes.

Dr. Bogue.—Then you have seen that the opening continued to grow with the growth of the mouth?

Dr. Ottolengui.—Yes, I have observed that. But I said that where a soft palate was used this tendency was overcome, so that in remodelling the instrument the flaps will be made smaller, if anything, to allow sufficient play to the muscles.

Dr. Littig.—While staphylorrhaphy may be surgically a success, any attempt to bring the tissues together, according to my observation, has always been a failure, which I attribute to the secretions which are constantly forming in the nasal cavity and passing down, which prevents the healing of the parts at that point.

Dr. Bogue.—As time advances, and the individual continues to grow, the cleft would have naturally been larger. With the velum in place, and constantly worn, do you say that the cleft had actually diminished in size?

Dr. Ottolengui.—Not that it has diminished, but that it has not grown larger. Moreover, it is now able to close more closely, so that a smaller instrument will better serve.

Dr. Bogue.—That is the best speech on artificial vela that I have heard for the past ten years, and it seems to contain more of demonstrated truth. As you all know, I worked on that subject for eight or ten years. I certainly wish to express thanks to Dr. Ottolengui for the statements which he has made to-night and for his method of stating them. They must carry conviction to all who heard him and who have comprehended the principles that underlie operations for the relief of this defect.

I should like to say one thing further. I wanted to ask Dr. Bishop, How do you know? Upon what facts do you base an opinion? We fail to keep accurate records for years, and that is where the weight comes in these particular cases. Surgeons perform operations, and dental surgeons perform others, and after a few months, or perhaps even less than that, the patient disappears from their sight, and they and we never know the ultimate results that are reached. Years afterwards, those who come across cases of opera-

tions from staphylorrhaphy find no particular improvement. The principle advocated a few moments since, that the earlier those operations were made the more beneficial they are, I think, is true. I have seen one or two that seemed to be of some benefit, but I have never seen one patient operated on surgically that could speak perfectly.

A vote of thanks was offered to Dr. Westlake and Dr. Bishop for their interesting papers.

Adjournment.

JOHN I. HART, D.D.S.,
Editor New York Odontological Society.

AMERICAN ACADEMY OF DENTAL SCIENCE.

THE regular monthly meeting of the American Academy of Dental Science was held in the Boston Medical Library Association rooms on January 4, 1893, at 7.30 P.M., President Brackett in the chair.

The paper of the evening was read by Dr. J. E. Waitt; subject, "Anæsthesia, and the Use of a New Ether-Inhaler."

(For Dr. Waitt's paper, see page 401.)

DISCUSSION.

President Brackett.—With Dr. Waitt's co-operation, the subject is before you for discussion.

Dr. Stevens.—What do I understand becomes of the exhalations?

Dr. Waitt.—This valve being open, everything passes out here. In case it is desired to quickly force patients through the second stage of anæsthesia, it may be done by closing the valve and compressing the bulb rapidly. Later, the valve can be opened again and the process carried on more slowly.

Dr. Eames.—I would like to ask Dr. Waitt if, in the rapid induction of anæsthesia which may be brought about by this special apparatus, he has noticed a disturbance in the circulation, indicated by blueness of the lips and face.

Dr. Waitt.—I have not seen a single case of it with this apparatus. You can guard against it by closing the valve and forcing a larger amount of ether vapor into the inhaler.

Dr. Fillebrown.—Do you mean that you can overcome cyanosis by giving more of that which produces it?

Dr. Waitt.—No. I take it that cyanosis is produced by the patient not getting the requisite amount of air with the ether. In this apparatus the amount of air can be increased without removing the inhaler or stopping the application of ether.

Dr. Fillebrown.—Then, in compressing the bulb slowly you have a larger percentage of ether vapor than you do when pumping fast?

Dr. Waitt.—Yes. There isn't time for the air to take up so much ether when it is being forced rapidly.

Dr. Fillebrown.—Do you know what percentage of ether the air takes up at the rate at which the bulb is ordinarily compressed?

Dr. Waitt.—I do not. Three cubic inches of air are forced through the ether with each compression of the bulb, but I could not say what percentage of ether is taken up, either at the regular or at the rapid rate of compression.

This rubber tube can be made long and the bulb placed under your foot, so that your hands will be free. This little hook is convenient for handling the bottle in hospital practice. The apparatus can also be fastened to the side of your chair.

The inhaler is the invention of Dr. Horace Packard, of this city, and can be obtained at Codman & Shurtleff's or at the Boston Dental Manufacturing Company. The present price is fifteen dollars, but they hope by getting out a greater number to make it less expensive.

Dr. Fillebrown.—I have had experience with this inhaler in one case, and I am very much pleased with its action, especially because it avoids the cyanosis which so often follows the ordinary method of giving ether. The patient with whom I tried this method I had previously anæsthetized in the common way, and cyanosis was very noticeable, so much so that we had to suspend the ether and resort to artificial respiration.

This inhaler has been in use for some time by the inventor, Dr. Horace Packard, but it has never been in the market until within two weeks.

In the operation referred to above, Dr. Batchelder, who was accustomed to the use of the inhaler, kindly administered the anæsthetic. The operation was staphylorrhaphy, and the patient was under the influence of ether for nearly an hour and a half. I had to stop frequently to have her reanæsthetized, but there was no cyanosis, and she recovered quickly from the anæsthetic and without nausea.

I feel very favorably towards the apparatus, and think it worthy the attention of those who wish to give ether or chloroform.

Dr. Williams.—Speaking of cyanosis reminds me of a little story regarding an apparatus that was presented some years ago to give a supply of atmospheric air. At that time the matter of anæsthesia was not fully understood, and in taking gas the patient would breathe into a bag and inhale from the same over and over again. An apparatus was devised which had an inspiratory and an expiratory valve, of which a descriptive circular came to me. I called on a person named in the circular, and asked him what his experience was with the apparatus. He said, "he had tried it a week or so and it had not worked very well." I then asked him, "Do you notice in using it that you have any blueness of the face or lips?" He said, "No; but he thought it was best to blue them a little; they were not so apt to feel it!"

Dr. Banfield.—I would like to ask Dr. Waitt if he uses gas in extracting.

Dr. Waitt.—I probably administer ether twenty times to gas once. I only administer gas for extracting one or two teeth, or in some operation not requiring much time. My preference is to use ether, and ordinarily, by carrying a person to the second stage of anæsthesia with this apparatus, you can extract the whole upper set of teeth without replacing the inhaler. Of course, if the teeth break easily and you have to dig for the roots, you could not finish the operation with one application of ether. But you have the advantage in using this apparatus that you are not wasting ether all the time, and it is not being distributed about your office, nor does the ether come in contact with the patient's face. In the average case of extracting, about half an hour would elapse from the time you commenced administering the ether until the patient was ready to leave the office. Out of one hundred tabulated cases where this apparatus was used, there were but two or three where any tendency to retching was observed, and those thus affected were etherized without paying attention to the time of eating.

Dr. Briggs.—I think this is a good thing. It secures a minimum amount of the drug and a proper admixture of air, and I don't think those two things have been so well combined in any apparatus before.

We have been accustomed to giving ether and chloroform in the most unscientific manner as compared with our care in the use of other drugs. We would not pour two or three ounces of laudanum into a man, and expect his system to absorb just enough of it and throw off the rest. That is practically what we have been doing in the old methods of giving ether, but here it is scientifically administered.

Dr. Moffatt.—I would like to ask Dr. Williams if he remembers the inhaler we used in Morton's time. I think Dr. Keep had one of them. It was rather bulky in construction, and the air entered only through the globe. Morton suggested that to force the anæsthesia you might plug up the orifice.

Dr. Williams.—He fixed it so you could "blue them a little." Yes, I remember it. He came near killing a classmate of mine with it; didn't give him air enough with the ether.

Dr. Waitt.—That was the original inhaler used by Morton.

Dr. Briggs.—I have been asked to supplement a paper on the use of cocaine in removing the pulp, which was read some time ago before the Academy. I will read you some of my cases treated last year.

The first case (January 2) happens to be the patient on whom I first tried the operation. Here was a tooth that had an exposed pulp which had been dressed with the desire to save it. The patient had neglected the tooth, and when she came to me again the pulp had become irritated, and I therefore injected cocaine, extracted the pulp, and filled the roots.

On January 14 I used this treatment on a sixth-year molar that I had been trying to save for six or seven years. The patient was a boy, and I had been waiting for the tooth to reach maturity so that I could put a cap on it. Having concluded that it had attained its full development, and that there was no need of longer keeping the pulp alive, I injected the cocaine, filled the roots, and prepared the tooth for a gold cap, which was put on a week later, and there has been no subsequent trouble.

The next case was a new patient, who came to me with an aching tooth from which she had been suffering for a week. I found an exposure, injected cocaine, extracted the pulp, and filled the roots at the same sitting. There was no trouble afterwards.

As I pointed out in the paper I read, you do not really kill the tooth, you simply remove the pulp.

The next case was also a new patient, who came in with the tooth-ache. When she left my office the roots of that tooth were filled. So it goes on. Fifty cases of removal of the pulp in a year perhaps sounds startling, but the majority were in new patients, who came with the toothache, and I have finished with the troublesome tooth then and there.

I will not take up more of your time, except to mention one case that was particularly successful. The patient came complaining of toothache, which was so intense that I could not touch the

side of his face on account of the pain. With a good deal of trouble I made an examination, and found an exposure in the lower right third molar where the pulp had hypertrophied. I found this old syringe-point with a trumpet-shaped opening, which just capped over the little enlargement of the pulp. I injected the cocaine and took the pulp out, and then told the patient what I had done. I do not tell the patients what I am doing until I am all through, because it might make them nervous.

One day, while operating for a lady, I found that there was an exposed pulp, and knowing the tendency to neuralgia when there was any trouble with her teeth, I injected cocaine into the exposure, removed the pulp, and filled the roots, and then told her about it. She expressed great astonishment, and said that I had not hurt her at all.

The idea is to have the point of the syringe cover the opening into the pulp-chamber, so as not to press the syringe into the pulp.

The solution that I use is a twenty-per-cent. aqueous solution.

Dr. Waitt.—Can't you get the same result with a ten-per-cent. solution?

Dr. Briggs.—I cannot get it with anything less than a twenty-per-cent.; and another very important thing is that it must be fresh. The solution is good for nothing when it is at all old.

Dr. Fillebrown.—How long does the anaesthesia persist?

Dr. Briggs.—Not very long; you have to work quickly.

Dr. Waitt.—How long after using cocaine do you begin to work?

Dr. Briggs.—I don't wait at all. I take the engine and go right to work. Sometimes I make a second injection, so as to make sure that there will be no pain.

Dr. Andrews.—I would like to ask Dr. Briggs what broach he uses.

Dr. Briggs.—Donaldson's.

Dr. H. F. Hamilton.—After a careful, thorough, and conservative practice of the method of removing pulps proposed by Dr. Briggs, extending over two and one-half years, I regard it not only as a pleasure, but a duty to report that I consider it the greatest advance in dentistry that has been made in many years. It is distinctly new and novel in its operation, and leaves the tooth in a healthier condition than when arsenic has been used.

All who have tried this method will, I am sure, agree with me in this statement. I have used it lately only in favorable places and conditions, with the rubber dam, and under such favorable conditions I have had uniformly successful results.

There are three ways in which one can fail :

1. The difficulty of access to the cavity rendering it impossible to force the cocaine into the pulp.
2. The use of old cocaine.
3. The non-ability to expose the pulp and properly apply the cocaine. This may come from lack of expertness in the operator or from nervousness of the patient.

The remedies for all such failures are apparent, and I see no reason why the operation should not take rank as a sure and safe one. By this method one can easily remove the pulp and fill the canal at one operation, and its rapidity and simplicity offer a relief from the necessity of capping many exposed pulps. I have, after watching many cases of my own capping, come to the conclusion that in most cases of patients of mature years, and in the teeth back of the cuspids, it is better to kill the pulp and fill at once.

I consider that a half-worn cement or gutta-percha filling, letting food in against the gum and allowing the teeth to crowd together as they may, a very bad condition, and sure to bring extreme disasters in its train.

Again, I think that we have not as yet realized the trials to patient and operator of calcifying and calcified pulps. Dr. Cooke has ably shown us how common they are, and all of us have realized their obscure and annoying symptoms, and the extreme difficulty of diagnosis and treatment. From my experience and from conversation with others, I am led to call your attention and ask your observation in regard to the extent of calcification of pulps under capped exposures.

I consider that in the majority of cases the capping of pulps is merely inviting calcification, and where the conditions are favorable for injecting cocaine, I think it better practice to remove the pulp at once.

I wish to add a word of caution as to the use of twenty-per-cent. cocaine in the mouth. The rubber dam should always be applied, and if the tooth is decayed too far under the gum, a matrix should first be put on. In several cases where this could not be done I have sealed the cavity with soft oxyphosphate, applied the rubber dam, drilled into the pulp carefully on the buccal side near the gum, and injected the cocaine there. I then quickly removed the oxyphosphate and extracted the pulp through the cavity. A few breaths of ether will aid greatly in the drilling.

Dr. Williams—I came across an article in *Merck's Bulletin* for December, mentioning, as a new preparation, tropa-cocaine (or

tropsin), which is an alkaloid recently isolated from a Java coca plant. Its advantages are:

1. It is less than half as toxic as cocaine.
2. Local anæsthesia, both of eye and skin, is much more quickly complete and is possibly of longer duration.
3. Its solutions are moderately antiseptic and retain their strength two or three months.
4. It anæsthetized in two minutes, and in one case in one-half a minute.

Dr. Hamilton.—I do not believe the members of the Academy realize the satisfaction to be obtained from this use of cocaine, and I advise you all to try it in the first favorable case.

Dr. Fillebrown.—Is there much hemorrhage?

Dr. Hamilton.—It is very slight; in some cases perhaps half a teaspoonful, and in other cases only a very slight quantity.

Dr. Fillebrown.—Not as much as when other agencies are used?

Dr. Hamilton.—Well, I don't know about that. I never tried any other agency for the extraction of a live pulp but once, and then I got only a piece of the pulp, but a great deal of experience.

Dr. Andrews.—I don't quite understand what is meant by the cocaine being forced in and around the pulp. Those of us who are familiar with the anatomical relation of the pulp to the dentine, as it appears under the microscope, know that it adheres to the walls of the tooth, and there is no chance for a fluid to get in between the two. I don't see in that case how you can "force it around the pulp."

Dr. Briggs.—I would not undertake to say that the cocaine is actually forced around the pulp, but that is the apparent effect. I mean to say that the best result is obtained by forcing it onto the pulp rather than into it. If your syringe-point happens to push into the pulp, you do not get the same result.

Dr. Fillebrown.—Is not the pulp compressible, Dr. Andrews?

Dr. Andrews.—To a certain extent; but if you cut a cross-section of a live tooth, you will see that the odontoblasts of the pulp are very closely connected with the tooth-walls.

Dr. Fillebrown.—Perhaps under the force used those little fibres are severed, and that may be a source of the anæsthesia.

Dr. Grant.—It seems to me that the actual force required to break down that connection would simply have the same effect as a steel broach.

Dr. Fillebrown.—The difference would be that the steel broach

goes into the pulp, while the cocaine may remain on the outside and yet force its way between the pulp and the tooth-wall.

WILLIAM H. POTTER, D.M.D.,
Editor American Academy of Dental Science.

ODONTOLOGICAL SOCIETY OF PENNSYLVANIA.

THE regular meeting was held at 1228 Walnut Street, Philadelphia, April 8, 1893. After disposing of the routine matters of the evening, the Committee on Clinics, by Dr. A. W. Deane, made a report as follows:

Dr. Genese operated this afternoon on a first bicuspid on the right side. It had received no treatment, and the gum was partly grown over the side of the root. He mounted the crown, soldered the pins, and placed the case in the mouth very satisfactorily.

(The patient was brought in and the work examined by the members present.)

Dr. Deane also stated that Mr. Kerr, representing the Downey Furnace Company, had brought in a portable furnace and baked a piece of porcelain in five to eight minutes, there being no odor or smell.

Dr. Genese, by numerous samples of teeth and crowns passed around to the members, and by drawings on the black-board and oral description, described his manner of using them and their construction. He stated that they could be procured from any dental depot, and they are manufactured by the Wilmington Dental Company.

Mr. Kerr, representing the Downey Furnace Company, said,—

"I am here to answer any questions you may like to ask in regard to its work. The crown is made of any of the teeth that are in use to-day. Grinding the teeth, except for length, is unnecessary. It is not absolutely required that it should fit the root or band. You can use it even if it is too short."

Mr. Kerr described the method of using the furnace, and stated that the time consumed in fusing the crown was only about two minutes.

At this point Dr. Genese read a paper entitled, "On Crowns."

(For Dr. Genese's paper, see page 413.)

After reading the paper, in answer to some questions put by the members, Dr. Genese remarked,—

"I can record about four hundred cases where these have been inserted. In the earlier stages we had some trouble, but by the process of heating the platina all that has been avoided. The only difficulty I had in the earlier operations was that of the platina box pulling out.

"The porcelain is of the very densest character, similar to that of Ash's porcelain, of London, and the more it is baked the better it gets, and the more it shrinks the tighter it is set in the box. There is no fear of its expanding or cracking after it is set. As a crucial test to which it was put I would refer to that of placing it on the anvil before it became cool, and cooling it rapidly within five minutes after soldering. So if there was any possibility of its cracking it would crack then.

"In the mouth, in masticating, they last exceedingly well. You can grind them to the thinnest possible edge without breaking. The pivot fits into the cavity its whole length, and in cementing, the extra cement will enter the box of the tooth and make it a solid crown and the tooth a homogeneous whole. One, two, or three pivots can be placed in the tooth as well as a single one."

In response to a question as to bridgework, the doctor said, "I have a special form for bridgework; not of that kind of crown, but one very similar to it. It has also the platina barbs inserted on the same plan."

Dr. Bonwill followed Dr. Genese, remarking,—

"I would like to congratulate everybody in making a move in the right direction and doing something that has not been done before.

"I see but one thing new about this, and that is the little porcelain strip fastened in the base of the tooth for soldering, which I cannot see is of any use, because a porcelain crown can be made of a shape that it is almost impossible to break in the mouth, if it is made of proper material, and without soldering and without platina; besides, I don't believe in the principle of placing a pin in the crown of the tooth. Many roots, in order to get in a pin of proper size, have to be cut so thoroughly to pieces that they spread and split, and it will be found that the oxyphosphate will be eaten out.

"The Logan crown is this exactly, except that it is infinitely stronger, cheaper, and easier put in. I would not take the trouble to adjust two pins and solder them, when I can do it more readily with all-porcelain English crowns. The only thing about it is a platina lining, which I always cut out to make the room larger in order to make it adjustable. An English crown placed in and thor-

oughly anchored in the root of the tooth is one of the strongest crowns that has ever been made. Don't use any with a pin in it. Anchor the pin thoroughly with anything of the character of oxyphosphate, and you can put them on without any trouble."

Dr. Genese.—My friend Dr. Bonwill has been contradicting himself. He first tells us he does not want a pin in the root, and then tells us to use a strong one. I came here with the idea of a system of pivoting porcelain teeth without reaming them out.

In answer to one objection of Dr. Bonwill's, Dr. Genese said, "My assistant happened to put a silver pin in the tooth I used today, and I thought it was platina. The silver melted in the box, and that left me with one root or one pivot standing in the tooth; to go through the work again and fix the pivot was more labor than I cared to take, so I simply cemented my second pivot into the tooth, as Dr. Bonwill advises, and then I put my tooth on one root and soldered the tooth to one pivot and the other pivot cemented in the root with oxyphosphate in the box of the tooth itself, thus carrying out both ideas, with the exception that I did not ream the roots out for fear of running through the sides and producing irritation.

"I differ with Dr. Bonwill as to the holding of an all-porcelain crown by itself on to the root, either by screwing it into its place or by oxyphosphate, with any porcelain we have at our command at the present time. If you dovetail your root, it must either be a true dovetail or the cavity must run right through the tooth and dovetail it on the grinding surface. If you do this the oxyphosphate or amalgam filling will wear away, or the porcelain crown will be discolored by the material used. The porcelain will not permit discoloration.

"I do not claim so much originality in it, but still think I have made a step in the right direction in simplifying the methods of crowning, both to patient and operator.

"There is another little advantage in these crowns that will meet many of the wants of the practitioner at a distance. The root can be prepared and a model sent to the depot, and a crown can be returned so nearly what is desired that there is very little trouble in fitting it. With the Logan root there is a doubt whether it will go in its place or not."

In speaking of the wax used, Dr. Genese said he used Parr's, stating that it remains in the box of the tooth and acts as a flux, so that the work is not disturbed in soldering, and the investment does not need to be wet to scald it out. The doctor stated that he

did not trust to it entirely, but dusted it with a little calcined borax to prevent the solder from exuding while it is being invested. A patient can ordinarily be dismissed in forty minutes with a perfect crown.

"The investment is Teague's compound, of Aiken, South Carolina, and while on the subject it may be of interest to you to know that this substance is good, not only as an investment for crowns, but for bridgework. In taking impressions of the mouth it can be used exactly the same as plaster. Pure gold can be heated in it, so that it can be understood that zinc or any other metal required can be used. A perfect result is assured. Mix it up with water in the same way as plaster. It can be smoothed, and manipulate it by adding a little water before it is quite set, which will give a perfectly smooth surface. It can be dried out and soldered in ten minutes from the time it is invested. I do not know its composition, but it is made from some fossil remains found in Florida. The Wilmington Manufacturing Company have special machinery for grinding it.

"I soldered that [exhibiting a case] in ten minutes after it was put in the case, a thing impossible with sand or plaster or any other compound.

"I have also found it very satisfactory in bridgework."

The fifth question submitted to the Society was then taken up for discussion, the subject being, "What are the Best Forms for Partial Lower Dentures, and Methods of constructing them?"

The President, Dr. Jack, stated that as he understood it the question was capable of two divisions,—what may be called three-fourths cases and the other full lower dentures. The three-fourths case is confessedly the one most used in dental prosthesis.

Dr. Genese submitted some specimens pertaining to the subject for discussion, and said, "These are all made for practical work; some temporary cases, others duplicates. They embrace most of the forms that will be met with in general practice, from one or two to a complete set. A great deal depends on the margins, the smooth finish of the work, and, above all, absolute freedom from pressure of the muscles of the lower jaw."

The doctor exhibited a case from his own mouth, which he stated he had worn for twenty-three years, and which had been mounted twice, and showed how it had been repaired without a band or fastener of any kind.

"In making partial dentures I dislike to have metal come in contact with the gum. I would trust more to a small wing of rubber

to go around the gum to keep them down until the muscles become accustomed to the strange feeling. I take advantage of the leaning forward of the last molars, and get it well under and then drop it down like a bent hook. In complete dentures I use the spiral springs. They are very useful, though I find they are very little known in this country. They are wound with eighteen-carat spring-wire, with a swivel and a small hook and screw between the lower ones to prevent going into the muscles of the jaw, and retain the denture in the mouth exceedingly well for a number of years before breaking."

Dr. Deane.—I have had more or less success and a good many failures, but have had more success with gold than with rubber, taking a plaster impression and making the cases very small. As a friend of mine, Mr. Frank Faber, once said, "File your lower case until you think you have spoiled it, and file it again until you think it will fit." I have followed that idea out with about as much success as it is possible to get. Simply fit the ridge of the jaw, and if there is no ridge, still hold to that law, and the articulation being as perfect as it is possible to get it, you will meet with more success than to trust to wide and bulky pieces of rubber or metal.

I think if the pieces passed around are not allowed to lap over the jaws, the fit will be more accurate and they will create less friction on the tooth at the band. I make the band of as near pure gold as I can get, very thin and small. Sometimes I find it necessary to cut it into two or three pieces, and then swedge and solder.

Dr. Nichol.—I have prepared these cases, using gold for partial lower dentures where the incisors are in position, and sometimes the first bicuspid, the object being to prevent the plate from pressing to the back part of the mouth. They are used when there is no molar to prevent the plate being driven posteriorly. The plate is swedged in the usual way, the band extending around the ridge just below the incisor tooth, and the whole put in the mouth and filed nicely to fit. An impression is then taken, and the whole invested and soldered in that way. The purpose is to get a band of gold broad enough to prevent cutting into the ridge running around the front of the tooth or the ridge just below the teeth. One of the advantages is to prevent the necessity of using clasps. It is rarely that a bicuspid can be clasped with satisfaction, as it is not adapted for it, and I think this method secures better results than clasping. It avoids the band that Dr. Genese speaks of, and makes a very firm and substantial plate.

Dr. Bonwill.—It is not surprising that this query should be made. For nearly forty years I have been looking at the vacancies in the lower jaw from the loss of the second bicuspid and first molar, and often the first bicuspid, leaving the second molar intact, with the cuspid in front, and in many other cases where there is nothing remaining posterior to the six anterior teeth.

The presumption is that the person formulating this question must have felt his own need in practice, but was not conversant with the history of artificial dentistry.

How few dentists have ever undertaken to fill such spaces, and how many failures are made when attempted! I think the question should have been framed, "Have we any means at present for satisfactory restoration of partial spaces in the lower jaw?"

If modern dentistry has a stain upon it, it is that such a question should have to be asked.

Efforts have been made that fully justify me in stating a method that perfectly restores the lower jaw to its normal action. Dentists are certainly either very obtuse or wanting in mechanical manipulation, or prejudiced against any plan or substitute when done by any one else than themselves.

A new method of clasping has lately been shown you that it would be well for every one here to try before he attempts to ask for anything new.

If those present will but recall an article I read before this Society several years ago, and at which time I gave a demonstration in my own mouth, as well as in others, and which for some reason was delayed in publication until a few months ago (see *INTERNATIONAL DENTAL JOURNAL*), I am sure they will find it worthy of some consideration.

To me it has been the addition of a new arm to my practice, and there is no one thing I have ever devised that gives so much satisfaction to my patients and to those dentists who have tried it.

Then, when I am asked such a question as No. 5 of this series of the learned heads of our profession, I feel somewhat like saying to such, Would you know a good thing if you saw it? Why do you, who appreciate the needs, not go to work and do, and not ask to have others exhaust their brains, and then give their efforts no attention?

All I have to say in conclusion is, that if you will read the literature of our profession, and learn to minutely follow details and make yourselves competent in mechanical art and skill, there will not be so many queries made, but we will have effort,—active

demonstrations by the dozen coming from every one of you who have the slightest conception of creating a substitute for lost organs in the human jaw.

I would again refer you to the published article in the February number of the INTERNATIONAL DENTAL JOURNAL, and you can see in my own mouth results of years, and a few unfinished cases I have here on exhibition, which, if not enough for the dissatisfied, I cannot offer you any more plans for the present.

Dr. Deane.—I think a great deal of the riding backward can be avoided by articulation. If the tooth was so ground as to form an inclined plane, this posterior movement that annoys us a great deal would in a measure be avoided, as I find it quite successful.

HARVARD ODONTOLOGICAL SOCIETY.

DISCUSSION ON "HYPNOTISM."

(For the papers of Drs. Osgood and Fillebrown, see pages 337 and 355, respectively.)

President Stanton.—The Society is to be congratulated upon being so well enlightened upon the subject of hypnotism, or suggestive therapeutics. I am very curious about and always interested in new things. I have read Bernheim's work, and have had some experience in hypnotism, but there have been so many cases detailed this evening that I will not take up your time. I shall probably be called upon before a great while to read a paper, and I then may have something to say.

Dr. Osgood has kindly consented to answer any questions, and I will take advantage of the opportunity to ask him a few. First, in chronic cases of long standing, what are the first symptoms of success? In other words, what success does he generally have at the first sitting, and how many treatments, as a rule, does a chronic case require before it is comparatively cured?

Now, all of us, in presenting a subject, always show the favorable side; that is, a man presents his successes, never his failures. I think quite as much is to be learned from failures as from successes, and I should like to inquire about what proportion of the patients hypnotized are benefited by the hypnotic treatment?

Secondly, I should like to ask about what is the proportion of people who can be hypnotized; that is, can the majority, say eighty per cent., of people be hypnotized if time enough be taken?

I have noticed, in reading Bernheim's work, that the operators quoted nearly always give their successes at clinics or hospitals. Is it not possible that the nature of the education of that class of patients who go to hospitals may have something to do with their susceptibility? Or my third question may be put in this way, Will Dr. Osgood please tell us if the success in his private practice is as great as that obtained at a dispensary clinic?

Dr. Osgood.—Let me answer these numerous questions before I forget them. As I have already told you, a person's success with this treatment depends very much upon the patient himself. As Bernheim says, "Every man has his own way of being peculiar," and these peculiarities must be studied. A chronic case may show a great gain at once, and the first symptoms of success in the patient who gains gradually will be that after he has received treatment a few times he probably will say, "I feel that you are going to help me; I slept well last night, and feel a great deal better for it. I think my appetite is better, and I certainly feel sensations in that limb which are new to me," and from that time forward there is marked improvement.

The results of a first sitting vary greatly in different persons, and an acute case would probably show larger relief than would a chronic ailment. An affection of recent nature would be apt to disappear at once. It might require several sittings. A chronic malady might find striking relief from one application of suggestion, and afterwards recover more slowly. The number of treatments required differs with every case. There is no rule. As to the proportion of patients who receive benefit, I can say merely that relief is the rule. A small percentage of cases cannot be hypnotized; other patients are not adaptable. Cases, of course, present themselves which cannot be helped by any sort of treatment; but, where a patient is suggestible, the general result of the treatment is success.

I should think suggestion would be very useful in dentistry, because the operation is very slight; but where the operation is severe, the natural fear of it on the part of the patient might be so great as to predominate all other influence, and thus render suggestion of no avail. At the same time, all kinds of surgical operations can be and have been performed under the influence of hypnosis.

As to the number of times a chronic case would have to be treated, in comparison with the length of time given to a purely medical treatment, that would depend upon the susceptibility of the patient. I do not mean by this the degree of somnolence he

reaches, for it is a curious fact that one patient will respond better in a light degree of sleep than others in a profound sleep. Patients differ so much in this respect that I cannot give a categorical answer to that question. One lady came to me who had suffered with headache for forty years and had tried everything that had been recommended by doctors and others as likely to help her. She was not suggestible, and I think I hypnotized her fifty times before she was sufficiently influenced to receive my suggestions to any extent, and she never had the same amount of headache afterwards. Another case that occurs to me was that of a gentleman who had always been in the habit of stammering, and came to me to see what I could do for him. I said to him, "Now, here is a beaten path which you have trod ever since you were a little boy, and it has become one of the regular habits of your life. It would be an effort for you to change your gait so that you could walk like a Prussian soldier, and so it will require days and days of treatment before I can make steady speech automatic with you. Your case is like that of a child who begins to learn an exercise on the piano, and who, at first, may say, 'Oh, I can never learn this,' but in the course of ten days he will play that piece and talk to some one at the same time." I hypnotized that gentleman about one hundred times, and the last time I saw him he said that he never stammered excepting when he was embarrassed. I will add that I advise those persons who have been cured of bad habits to come to me about once a month and be braced up.

Answering the question as to whether anybody can be hypnotized if time enough be given, there are records of extraordinary cases where patients have been hypnotized hundreds of times without being sufficiently influenced to receive suggestion. The most striking case of success seems to be one recorded by Beaunis, who tried every day for six months to put a lady to sleep, at the end of which period she one day fell into a profound slumber, and could always subsequently be hypnotized. But, you see, there is a question of money in this. I cannot give the time to a patient who is not easily affected, nor usually does the patient care to assume the expense. Ordinarily I try a difficult patient three or four times, and can then tell whether much time will be necessary in order to affect him. In such case the patient generally abandons the attempt. Out of one hundred patients, ten to fifteen cannot be influenced in the slightest degree. Bernheim himself failed to hypnotize a young lady who was a patient of mine, but whom I could influence to the first degree. She was abroad, and, simply out of

regard for my interest in the treatment, took the trouble to go to Nancy. Bernheim did not influence her as much as I did. He is a man of extraordinary ability, but the lady had the idea when she went there that, as I had tried and Tuckey, of London, had tried, Bernheim probably would not do much better. This feeling may have prevented his success. Bernheim claims ability to affect, to one degree or another, ninety per cent. of his cases. I should say that in ordinary cases eighty per cent. ought to be influenced by every fair operator.

Concerning the relative proportion of success in private practice compared with that of the hospital, I am glad you mentioned that. It is smaller, because, all other things being equal, the cultivated mind is more difficult to reach than a mind which is simple and direct. A patient came to me last week from New York who was a very intelligent lady, and who had read somewhat on this subject; at the same time she believed that she could not be hypnotized, because yielding to hypnotic influence seemed to her a sign of mental weakness. I immediately suggested to her that as learned a man as Louis Agassiz became a perfect child under the influence of hypnotism, which evidently satisfied her mind on that point, because I had no trouble in putting her to sleep.

Another element which must be taken into consideration is the fact that in private practice one has a more independent class of people, and one must approach them in a different manner from that which one would use in a hospital, where the patients know they must obey orders or be sent away. Moreover, the hospital patient yields more readily than a private patient because he is influenced by seeing others about him fall asleep under suggestion.

Dr. Briggs.—Will Dr. Osgood please tell us if he does not sometimes meet an obstacle from the influence of outsiders who teach these suggestible people that there is danger to them in hypnotism, and if he does not find that such people are unnerved by it?

Dr. Osgood.—No; because while such a patient is asleep my suggestions that the treatment is harmless and helpful will impress the mind of the patient more than anything which may be said to him when he is awake. Even though that patient may be suggestible in the waking state, he would be still more so under the hypnotic influence. And if I found that some one was trying to make him believe that the treatment was dangerous, I should simply say while he was asleep, "You will not be affected by anything which is said to you on this subject while you are awake," and he would not be. But I have no such experiences.

Dr. Clapp.—I would like to know if Dr. Osgood has ever been under this suggestive influence himself?

Dr. Osgood.—No; I have not. I don't think I could be hypnotized. Liebeault, who has had enormous experience, says he has often been hypnotized by what he calls "fascination;" that is, the fixation of his own eyes put him to sleep instead of the patient. I have never been in any way affected by it.

Dr. Smith.—Is it possible to exert this influence on very young children?

Dr. Osgood.—It is admirable in children; the process is so simple, so direct, and so uncomplicated. Liebeault, who was a simple old man, says, "This really goes back to the days of the disciples. I find that by simply laying my hands on the children they become cured." This showed the power of suggestion, and if you will think of it you will see that suggestibility and suggestion rule us in all directions.

Dr. Hopkins.—I would like to ask Dr. Osgood if he has had success with this treatment on the slightly insane?

Dr. Osgood.—I have had several cases of fixed idea. One was a young lady who was very unhappy, because in church she imagined that the clergyman became embarrassed when he looked at her, and that he would become agitated if she spoke to him. She brooded over this a great deal, and it was finally decided that she should go away for a visit, and she came to Boston. While she was under hypnotic influence I told her that she must trust me; that the thing was now past and was nothing but a memory; that she should think nothing more about it; and I felt perfect confidence that when she got home she would find that I was right. After reaching home, she wrote me very gratefully, saying, "You are right; it is nothing but a memory, and does not disturb me any more." Another case was that of a lady who imagined that people made faces at her in the cars and on the street, and for that reason she disliked to go anywhere. I helped both those cases. Later, Dr. Cowles called me to the McLean Hospital to see a woman who had religious insanity. She would not touch a knife, fork, and spoon, nor three biscuits, three oranges, nor three articles of any kind, because they represented the Trinity to her, and when I was called she had refused to eat anything, because she said God did not wish her to eat, neither did He wish her to go out of doors. She was a fair subject and I succeeded quite well; but the next time I went to her, I unexpectedly met a very serious obstacle. She said that God had told her she was not to be hypnotized any more, and

of course there was the end of it. In this direction, however, my experience has been limited. Voisin, of Paris, is the only man who has attained any degree of success with insane patients. But this is largely due to his enormous patience. He sometimes spends two hours upon a patient at one sitting. I cannot affect the insane as he does. Melancholia can be reached, but it is very hard to touch the fixed idea. That predominates everything.

Dr. Smith.—I would like to ask Dr. Osgood if it is not possible for him to influence patients that he has hypnotized when they are away from him?

Dr. Osgood.—Patients who are very susceptible, yes. But they must have been previously hypnotized, and the suggestion must reach them in a practical form. Patients have been put to sleep by the telephone and by mail. The sound of the voice of course makes the better suggestion, but if the doctor ends a note thus: "Now, when you finish this letter you will lay it down and sleep for half an hour," the patient will do so. Of course nobody can be influenced at a distance except by some one who has hypnotized him before, and the patient must be very suggestible.

Dr. Shepherd.—Are not many of the so-called "faith cures" something after the nature of hypnotism?

Dr. Osgood.—For information on that point I would refer you to a very interesting paper on "Psychical Research," in *Harper's Magazine* for June, 1890. In a foot-note the author virtually says, "This influence of mind upon mind explains the few successes of the faith cure, the Christian Science, and other methods of a similar nature practised by persons who have no medical knowledge, and treatment of this nature should be rescued from such hands and placed in the hands of people who have science to back them up." When Braid was teaching his patients he simply put them to sleep; but you see the patients came expecting to be helped, which was of itself a suggestion, and the result was they got well without a word. That is really the basis of the faith cure; it is a very weak form of suggestion, and through that suggestion comes a measure of relief. It may help the very susceptible cases which are merely hysterical, but you do not hear of its curing many cases of neuralgia, rheumatism, heart trouble, and so on. It is not hypnotic suggestion, and it does not include a necessary power of making an intelligent diagnosis.

HENRY L. UPHAM, D.M.D.,
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CHICAGO DENTAL CLUB—MEMORIAL MEETING.

REGULAR meeting March 27, 1893, Dr. G. W. Haskins in the chair.

After the reading of the minutes of the previous meeting, the Club resolved itself into a memorial meeting and listened to speeches on the life and character of Dr. W. W. Allport.

The first speaker of the evening was Dr. L. P. Haskell, who said,—

Mr. Chairman, Walter W. Allport was born in Loraine, Jefferson County, New York, in June, 1824, so that had he lived until next June he would have been sixty-nine years old. He had a common-school education. Somehow his attention was called to the practice of medicine, and he entered the office of Professor Amasa Trowbridge, of Watertown, New York. I cannot say how long he remained; but he turned his attention to the practice of dentistry, entering the office of Dr. Robinson, of Watertown, where he remained several years, and then went to Rome, New York, and was associated with Dr. Perkins. In 1854 he removed to Chicago, and rented the corner of a room in a physician's office on Lake Street, just west of Clark, over the drug-store of J. N. Reed, the leading wholesale and retail house in the city, and where was kept for many years the only stock of dental goods.

My first acquaintance with Dr. Allport was in July, 1856. At that time his office was on Clark Street, opposite the court-house, in a two-and-a-half-story brick building with a basement. He had been here two years and had built up quite a practice, having secured the patronage of many of the best families, and was getting fees rather in advance of the times.

In 1858, Dr. Allport was elected President of the Western Dental Society. He was one of the originators of the American Dental Association in 1860, and was elected its first chairman. In 1865 he was elected President of the American Dental Convention, and in 1886 was elected President of the American Dental Association.

In 1881 Rush Medical College conferred on him the degree of M.D., and he was for a number of years emeritus professor of dental surgery in that institution, and afterwards held the same position in the Chicago College of Dental Surgery.

He was instrumental in creating the dental section of the Ninth International Medical Congress, which met at Washington in 1887, and was made the Vice-President of the section, and labored assiduously to make it a success. He was one of the organizers of the

Chicago Microscopical Society, and for several years its President, and awakened much enthusiasm in microscopical research.

It was through his persistent efforts that the Columbian Dental Congress, which is to be held in Chicago next August, was organized, and to which the dentists of the world are invited, and of which he ought to have been elected President.

Dr. Allport was unique in his make-up as a dentist; in fact, I have often said it seemed as though he was "made to order" for an operator. A man of fine appearance, handsome, of commanding figure, pleasing in his manner, inspiring confidence in his patients, of keen perceptions and sound judgment, remarkably deft in the use of instruments, rapid in his movements, a mechanic and an artist; in fact, there seemed to be nothing lacking in qualifications for what he proved himself to be,—a dental operator without a peer. Not only this, but he was original in his methods. It was worth going a long distance to see him fill a cavity. Using but few instruments, and never at a loss as to the right one to lay his fingers on; going straight to the mark, making every stroke tell in the preparation of the cavity; then preparing his gold, he seized a pellet with the pliers, and passing it through the flame of the spirit-lamp, quickly put it in place, and holding the pliers between his teeth, rapidly packed the gold until the cavity was full. When polished, the product was a finished piece of work. As I remember him before the days of modern appliances,—engines, electric motors, rubber dams, mallets, etc.,—when the methods were far more difficult than now, twirling the burr in the fingers, using the file instead of the corundum and disk, the napkin instead of the dam, the hand-plugger instead of the mallet, and finishing-appliances crude as compared with the present ones, and yet seldom occupying more than an hour in filling the most difficult cavity, he was truly a master of his art. Just in the matter of changing napkins during the process of filling a lower tooth, with the saliva welling up, it was with a sleight of hand I never saw equalled.

I carried in my mouth for thirty-two years a gold filling in the posterior proximal cavity of an upper second molar, which could only be seen by the use of the mirror, which he was only fifteen minutes filling, and which was perfect when the tooth was extracted.

Some time in the sixties he commenced microscopical investigations as to the cause of the sensitiveness of dentine, the distribution of nerve-force in the tooth-structure. He conferred with Professor Leidy, of Philadelphia, who seemed to agree with him in his

conclusions. About this time he performed a unique operation which excited much interest. It was the removal of a portion of the pulp in a molar tooth, dissecting a flap of periosteum, and covering the nerve, and then covering this with a temporary filling of gutta-percha. After waiting a certain length of time, he removed the filling and found a deposit of dentine over the pulp. This result he showed to many dentists from time to time for several years.

Dr. Allport was not only a fine operator, but he had fine taste in the arrangement of teeth for artificial dentures. In this he was unexcelled.

Dr. Allport was a good speaker, always able to express himself clearly and concisely, and equally also as a writer, as the papers he has written for the various societies and journals have shown. Among the earliest of these was a paper read in 1855, upon "Diseases of the Teeth," before the Cook County Medical Society, of which he was a member, giving the result of his investigations as to the effect of various acids upon the teeth. Later on was a valuable paper, which he read before the Boston Academy of Dental Science, in which he took strong ground in favor of a division of practice and educating a class of men exclusively in prosthetic dentistry. He had for many years labored assiduously in favor of the dental student being more thoroughly educated in medical knowledge; in fact, went so far as to propose that the dental student be educated in the medical college as a specialist, the same as the oculist, gynæcologist, etc., and then to go outside of the college to learn to make artificial dentures.

In 1863 and 1864 he edited the *People's Dental Journal*, a quarterly, whose object was to furnish the profession with reading matter pertaining to the teeth for the instruction of their patients.

Dr. Allport was not apt to be hasty in his judgment of men and matters, and would carefully weigh the subject, but when once his mind was made up it was difficult to swerve him. As is usually the case with men of strong and determined character, he made some bitter enemies as well as earnest friends. It was his ambition to do all in his power to elevate his profession, and so in concerting measures with this in view he often had contests with others. In doing this he usually carried his point, for he was shrewd and knew how to marshal his forces.

His family consists of his wife, daughter, and three sons. The oldest, Dr. Frank Allport, now practising in Minneapolis, has built up a lucrative practice as a specialist of the eye and ear. The

second son, Dr. Walter H. Allport, is practising medicine in this city, and though yet a young man, has taken an advanced position in the profession. He is assistant surgeon at the Exposition grounds. The third son, Harry, is located in business at Portland, Oregon.

Dr. Eugene S. Talbot.—How often do we record in our books the death of some one of us who had spent many years in our profession! but who of us will leave behind the record of such an active life spent in dentistry as Dr. Allport?

Previous to my acquaintance with him in 1870, I looked upon him as a wonderful man. With the respect of the profession and people at large and his great ability, it seemed as if he possessed all the requirements for a successful practitioner. He was a disciple of the late Dr. Harris in believing that dentistry was a part of the great mother profession,—medicine,—and was instrumental in the establishment of the chair of dental and oral surgery in the seven medical colleges in Chicago; and also, that physicians might know something of the teeth and associate parts, he assisted in the formation of the Section of Dental and Oral Surgery in the American Medical Association. Since that time we have heard no more of the old subject, Is dentistry a specialty in medicine? That question has now been settled forever. Later he felt that many eminent dentists were prevented from becoming members of the Association because they did not hold the degree of M.D. He framed a resolution, which was offered by Dr. N. S. Davis, ex-President of the Association, which was adopted almost unanimously, there being only two dissenting voices, to the effect that graduates of such dental colleges that required a course of study equal to the best medical colleges should be admitted to membership in the Association; thus it seems that he has done all that was possible to draw the dental profession into the fold, and in 1882 he accomplished all that Dr. Harris dreamed and attempted in 1842.

My intimate acquaintance with him began in 1880, and I had always found him to be a man of integrity and honor, despising all that was low and seeking to elevate the profession. Strong in his likes and dislikes, and wholly unselfish, he was hated by many, but those who won his admiration can truly mourn for him. To the poor, struggling young student, just starting out on life's rough sea, he was a beacon-light, help in counsel and money coming from him when most needed and appreciated.

He was a firm friend and leader of the profession, always ready to put his shoulder to the wheel and help steer away from danger.

In conclusion, I can only say that the profession has been raised

to a nobler standard by his having made it his life's work, and as the poet says,—

“Gone before us, O our brother,
To the spirit land !
Vainly look we for another,
In thy place to stand.”

Dr. E. L. Clifford.—Mr. Chairman, to be called upon for an expression of respect, a tribute of affection in memory of a loved friend whose presence will never again lend light and dignity to our councils, is an honor and privilege I need scarcely say I appreciate.

When serious apprehensions were first expressed that Dr. Allport might not recover from his illness, I could not but recall the, to me, strange coincidence of my feelings of love and veneration for him, and, strange as it may seem to tell it here in Chicago, in which city I have lived for ten years only, my first recollections of the study of dentistry are fraught with reminiscences of Dr. Allport. When I was studying under my father away down in Louisiana, he exacted that I should listen with him to the reading of his dental journals by my mother. My mother always read his journals to him winter evenings. When a late journal was to be looked over, my father's first inquiry was, “See if there is anything this month from Dr. Allport;” consequently to me the name became a synonyme for authority upon the subjects upon which he wrote, and, under my father's direction as I grew older and advanced in my profession, I read everything I could find from his pen.

A few years after my graduation, fate sent me to Chicago, and certainly one of my most cherished wishes was to become acquainted, if possible, with Dr. Allport. Opportunity favored me at one of the meetings of our Dental Club, where for the first time I had the pleasure and honor of meeting him. I do not know why I say pleasure, for certainly I never met a man of whom I was more afraid and into whose presence I so much dreaded to come. I had read a paper that evening, and after the meeting Dr. Allport came to me and wanted to talk with me. When I tell you that in addition to my feeling of partial acquaintance with him through the media of dental journals, I found upon first sight of his venerable presence a striking resemblance to my revered father, you can, with me, possibly account for the magnetic influence of the man of years and wisdom upon the younger man, the anxious seeker after knowledge in fields of medical and dental lore. Dr. Allport's warm, cordial manner disarmed me. The fear of critic or censor vanished, our pleasant interview ended leaving with me

the comfortable feeling of having gained a friend, and such time proved him to be, for in no emergency or dilemma did I ever find him indifferent to my solicitations or too busy to advise; and right here I shall quote his exact words when I felt, in duty to myself, bound to know how far or how often I might trespass upon his valuable time. (We all know his time over his chair was liberally paid for.) His reply was, "Dr. Clifford, I have been practising dentistry for nearly forty years, and I do not know that I have ever seen a day during that time that I did not have room enough on my appointment-books for another patient. There are practitioners who cannot take another patient, but I have never seen the time when I was not able to welcome a friend and glad to have him call on me. When you come to see me you will always receive a warm welcome."

Will you permit a brief simile? In the building up and beautifying of such cities as our own phenomenal Chicago many structures had to be removed, some demolished, and we younger men know that to many some of these were entitled to the distinction of being called landmarks. To the first settlers, the pioneers of our great city, landmarks were almost shrines, because around them clustered reminiscences of brighter, younger manhood, and though, with all the pride inherent to the progressive ambitious man, they saw them of necessity superseded by structures better fitted to the wants of an advancing age and population, yet the old were gone, and with them memories only cherished by those who had known them as rendezvous of important, serious deliberations or social relaxation, as the case might be, and when they met as neighbors and friends to discuss the work of those who, to them, were iconoclasts, the tribute of a sigh—maybe a tear—was offered to the relentless mandate of destiny. All things change; the old must give place to the new. In the rapid strides, the crowding needs of mental activity, the ambitions of professional life, the hurry, ay, and even the patient, hopeful toil of him who sees the topmost round of the ladder still hard to reach, learning, with each day's and each night's effort by the midnight lamp, that it is not reached at a bound. The lesson of the growth of our city is one we may to-night take home to ourselves in our professional lives, our hopes, our ambitions. Our honored predecessors, whose lives, whose attainments, whose example were not, as in the architectural world, "landmarks," but I will say beacon-lights, apostles of learning and wisdom,—shall we see them fall at our side and, the vacant chair filled by the younger, eager aspirant for name and

place, refuse the tribute of a moment's pause from the routine of business, to say we honored, we loved them, and we miss them? I do not hesitate to say that I shall miss the storehouse of wise experience from which I was welcome to draw always, as was every other young progressive dentist. To me the death of Dr. Allport is indeed a personal loss professionally and socially, and I shall always regard it as one of the greatest honors of my professional life in Chicago to have known him, to have been associated with him in the same building, to have met his family, to have dined with him and had him dine with me, and last, though sad indeed the duty, to have been selected as one of the active pall-bearers at his funeral, the last effort that I could put forth for him.

Dr. C. N. Johnson.—I want to add my quota to what has been said regarding Dr. Allport. I became acquainted with him when I first came to Chicago in the fall of 1884. I called on him armed with a letter of introduction from Dr. Haskell, and the result of that call was that Dr. Allport gave a private clinic at his own office, the victim of the clinic being Dr. Haskell. Several others had operated on Dr. Haskell, and finally he said to me, "You fill that next tooth." I picked up the instrument, and the moment I did so, Dr. Allport made a remark that has inspired me ever since, that has encouraged me to do as good work as lay in my power.

I have been very intimately brought in contact with Dr. Allport recently on account of circumstances which I will relate. Last fall the editor of the *National Magazine*, a journal of American history, approached Dr. Allport for his biography, and asked him to select some one to write it. He selected me. In going over his past life and the struggles of his youth, I was brought into intimate relationship with him, and I will recite one incident which I think illustrates a phase of Dr. Allport's character that few of his friends know about. He was infinitely tender-hearted.

After I had finished the biography, before sending it to the publisher, I wanted to go over it with him to hear him verify the dates. I made an appointment with him to come to my office. He came, and I sat down and read the biography. In summing up the characteristics of the man, as any other biographer would do, I said something complimentary. It was nothing, however, but the truth. When I looked up, after reading it, I saw him sobbing like a child and the tears streaming down his face. It was a revelation to me, a complete surprise. After he went to his office he wrote me a letter of apology, as if a man needed to apologize for showing he had a tender heart!

In regard to Dr. Allport's ability, I saw something a short time since which was a monument to his skill. I was in his office and he showed me some fillings that he had put in over forty-two years ago. They were doing good service, with every prospect of lasting as much longer, if the patient lived. I might go on and mention many things regarding my personal experience with him; but personal reminiscences, however interesting to his friends, are scarcely adequate in dealing with a character like his.

This man whom we are called upon to mourn to-day started life at the bottom of a rough and rugged hill. A stone met his first step; a rock stood towering above his tiny form. But he turned his face resolutely towards the summit, and never lost sight of the star of hope. Thorns were in his path, ready to pierce his quivering flesh. Pebbles rolled beneath his feet. Storms swept down the mountain-side, and threatened to carry him into the depths of the valley below. But baring his breast to the blast, and lifting his brow towards the merest fleck of blue in the darkened canopy above, he never looked behind. When for a moment the force of adverse circumstances drove him struggling to the rear, he regained his lost ground by a burst of that magnificent courage which was his most conspicuous trait. His energies never flagged, his heart was never faint; and toiling on and on, through a lifetime of endeavor, he was at last rewarded by the attainment of a greater height than is given most men to reach. And standing there on the summit of the mountain's highest peak, his heroic form sharply outlined against the limpid blue, he paused for a moment,—a moment all too brief. Looking back over the field of his accomplishments, he saw scattered down the mountain-side the forms of many friends, and as the light began to dim his eyes, he waved his hand, in prophecy and adieu, and, turning, passed over into the limitless beyond.

We have nothing left but a memory, but so long as dentistry shall have a name the individuality of Walter Webb Allport will live beside it. And now, in this moment of final farewell, those who loved him best will mingle with those who loved him least, in weaving about his memory a wreath of immortelles.

Dr. Ira B. Crissman.—I had the pleasure of making Dr Allport's acquaintance at the organization of the Chicago Dental Club. Like Dr. Clifford, I always approached him with admiration, looking up to him with high esteem, seeming to feel my inferiority while in his presence.

I called on him when he was first taken ill, and found him very nervous, seemingly excited. After a lengthy interview, he con-

cluded by saying, "Doctor, I have a few enemies. We cannot seem to come to an agreement. I would willingly lie down to-night and die if there could be an adjusted understanding between us." It was a very solemn utterance from one so highly honored and respected. I never had anything to impress me so deeply.

On the following Monday he sent for me, saying there was a tooth that was irritating him very much. I attended to the summons immediately; found the doctor in bed, being irritated by a sharp corner on a cuspid tooth, caused by abrasion. I removed the sharp edge by drawing a separating file over it. His mind seemed perfectly clear. The care and precaution he always observed in his every-day practice was not forgotten, even while suffering physical torture. He said, "Doctor, do not forget to wash your hands. You will find carbolic acid in that bottle on the wash-stand; remember, you cannot be too careful." He seemed to recognize the critical condition he was in, for on the following day when I called, he made this remark, "I'll be all right if the erysipelas does not go to my brain through my ear and nose." The next day he became unconscious. His life's candle was fast becoming extinguished. I looked upon him as a beacon-light, a light-house that stands on a hill only to be extinguished by death. His advice to me was always greatly appreciated. I shall always remember him as a senior guardian, one willing at all times to lend a helping hand to his many friends and associates. I feel that I will be a better man and do better work by having known him,—“a bright star in the professional firmament eclipsed.”

Dr. E. J. Perry.—I simply wish to testify to the high character of Dr. Allport. While I have not known him as intimately as some of you, I have been drawn to him by the quality of his cordiality, affability, sincerity, gentleness, courage, high professional character, attainments, and venerable presence. He was a splendid man. I shall ever cherish his memory.

Dr. A. E. Baldwin.—Probably there is no member of the Chicago Dental Club who personally feels the loss of Dr. Allport more than myself. The years that I have known him have been, and will be as time goes by, fraught with the most pleasant memories. I came to Chicago entirely a stranger and a student in our specialty. Among the first that I met was Dr. Allport, and what I am to-day I owe more to him than to myself. These are his words when I first called upon him for counsel: "Dr. Baldwin, do not do as you contemplate doing. It won't pay to turn your back on any trouble. Face it and fight it out." I have lived only a few years since then,

but I have learned that that was good advice. We all realize that a great man has gone from us,—a great man to the world at large in his influence and in his wide circle of acquaintance. It is somewhat surprising that he could find the time to be the help to me he was, and I find in talking with my friends that he also had time to devote to them and their interests. A man like Dr. Allport can do great and little things, and the little things have a greater influence in after-life than the great things. We can point to him as a professional man, as a friend of higher education, of advanced standards of learning, and it is a pleasure to us all to have been associated with him in any way.

A few years ago—you perhaps all know something of the circumstances—I was associated with Dr. Allport, by being an officer of the American Medical Association, in carrying out the formation of a section in the Ninth International Medical Congress, which met at Washington; I had a large correspondence in connection with that work, and was brought in more intimate contact with him. One time, while I was in his office, I said to him, "Dr. Allport, you are the greatest man I have ever met in the dental ranks." "Why?" he asked me. I said, "For this reason. You set your mark, and you can bring the event to pass that will bring success to it more than any man I ever saw. This matter is going to succeed, and largely through your efforts." He sat back in his chair, wiped his glasses, looked at me, and said, "Do you know why?" I made some remark, but I do not exactly remember the words. He said, "I have been a practitioner of dentistry for many years, and have been an observing man, and I have yet to be placed in a position where I did not advocate that which I firmly believed was right." Dr. Allport could grasp a point as quickly as any man I ever met; and he was not working for this or that office, he was working for what he assumed to be right, and in the instances where I went to him for advice, the first thing he wanted to grasp was the situation, and then his efforts would be directed towards doing thus and so, because he believed it was the right thing to do. I believe that Dr. Allport should be noted more especially for (1) his quickness of grasp, (2) his ability, and (3) his integrity and perseverance. There are very few men that I know of who would refuse the highest public office in connection with our specialty if it were offered them. I know that Dr. Allport did that, and others here know it. He had a reason for so doing. In a letter which he read to me regarding the matter, he said, "I would consider it a great honor and privilege to accept such an office, but I do not think it would be for

the best interests of dentistry for me to do so. Another man [whom he named] would do better than I could do, because some see fit to misinterpret my motives and actions, and we must find some one upon which the profession can harmonize and work for this end." Is there anything grander than that a man can do? Is there anything higher he can do than that? If there is, it is beyond my comprehension.

A few weeks ago Dr. Allport was at my house, and he was feeling poorly, and I do not suppose I should have thought of this conversation if I had met him at the Society afterwards and he still alive and with us. A letter from Dr. Talbot a short time later stated that he was very ill, and probably would not recover. But I remember the conversation we had then. He spoke of his time on earth being very short. I do not think, however, he meant by it that he thought he was going to immediately die. He saw he was getting feeble, and while with me that day had to spend most of his time lying on a couch. He was having some trouble, of which we are all aware, and it was bearing heavily upon his mind, for the reason that he did not know what was exactly right, and he wanted to do what was right. In the remark he made to me in regard to the trouble he was having, he said, "I wish I knew what was the right thing to do." We all know that if Dr. Allport knew what was the right thing to do he would do it.

Dr. Johnson has said a thing that ought to be emphasized,—namely, that he had a tender heart, and was more conscious and careful of the feelings of others and his influence upon them than we can yet realize. Twenty years from now, if we are living, we can understand this man's life better than we can to-day. It has been remarked that Dr. Allport had enemies. I believe he had, but he had fewer enemies than we think. There are those that had axes to grind, who had political ends to attain, who knew that Dr. Allport was a stumbling-block in the way of getting these ends accomplished; and although he perhaps was disliked by some, I believe there were very few who did not in their hearts have the utmost respect and veneration for him. I shall prize his memory and the fact of such an intimate personal acquaintance with him. I shall always feel that I am a better man for having met and known Dr. Walter Webb Allport.

Dr. M. A. Newman.—I think Dr. Allport was one of the few men whose words, written or spoken, upon subjects pertaining to dental science were always worthy the attention of the profession.

Dr. I. A. Freeman.—I am probably one of the oldest members

present who has known Dr. Allport, and what I shall say with reference to him will be from the stand-point of a student and later as a practitioner. He was certainly at the head of the dental profession in this city at that time, although there were other dentists as highly respected. Every dentist always held Dr. Allport in high esteem. There were a few young men here, and they were all anxious to become familiar with his method of manipulating gold and the treatment of teeth. Every young dentist in practice for the succeeding fifteen years met with many of Dr. Allport's patients, who had left him because of his high prices, and in that manner we all came to know the character of his operations.

In his earlier as well as later years he was advanced upon the subject of treatment of teeth and of the filling of root-canals. I recollect his remarks at a meeting of the American Dental Association in Crosby's Opera-House, in 1865, where he outlined his process of treatment of diseased roots that had lost their crowns, and upon which he desired to place an artificial crown. At the same meeting he advocated the use of the rubber dam introduced by Dr. Barnum. While I always felt it desirable to make the acquaintance of a man who had attained the position he had, it was not my fortune to meet him personally until within the last ten years. As we know, there has been an antagonistic feeling on the part of many members of the profession towards him, but it is not because of his being in the wrong; he has been in the right largely. Dr. Allport has done much to help us in this better, broader, and more helpful condition of things. Every dental student, old or young, is to-day indebted to him for the stimulus he ever gave to higher dental education; the benefits the public are receiving at their hands is an ever-living testimony to his memory.

RESOLUTIONS OF THE CHICAGO DENTAL CLUB IN MEMORY OF DR. W.
W. ALLPORT.

WHEREAS, In view of the loss we have sustained by the decease of our friend and associate, Dr. W. W. Allport, and of the still greater loss sustained by those who were nearest and dearest to him; therefore, be it

Resolved, That Dr. Allport was a man of good principles, lofty in his ideas, conscientious in his dealings, strong in his purpose for right, and far-sighted in the requirements of the profession, and that it is but a just tribute to the memory of the departed to say that, expressing our regret for his removal, we, the members of the Chicago Dental Club, mourn for one who was in all respects entitled to the regard and admiration of every one with whom he came in contact.

Resolved, That we sincerely condole with the family of the deceased on the

dispensation with which it has pleased Divine Providence to afflict them, and commend them for consolation to Him who orders all things for the best, and whose chastisements are administered in mercy.

Resolved, That this heartfelt testimonial of our sympathy and sorrow be forwarded to the family of our departed friend,

L. P. HASKELL,

E. S. TALBOT,

C. N. JOHNSON,

Committee.

Editorial.

THE PRESENT AND FUTURE OF SCIENTIFIC PUBLICATIONS.

WE are dwelling in an age of rapid thought. The steps that lead to the pinnacle of endeavor are not taken with slow and rhythmical precision, but with leaps and bounds, so quickly made that to the ordinary mind they are confusing in their rapidity and far-reaching power.

From the date when Gutenberg invented movable types, the thought has possessed the mind of the world that the only proper and permanent mode of communicating ideas was through the medium of books, and these have multiplied into libraries, and libraries have extended into every hamlet of the civilized world. To the bibliophile this is a very satisfactory condition. The larger the number of books the more conclusive the evidence of an advance in civilization.

In a purely literary sense there can be no controversy with this feeling. The work of the ages lives in the volumes of the libraries, and the world would be poor indeed were it possible by a cataclysm to blot this accumulated thought and experience from the face of the earth.

While recognizing this universally-accepted truth, it is with no iconoclastic spirit that the question is prominently asked, Have books, and especially scientific books, ceased to have special value as a means for higher training? The interrogatory is too broad a one to be answered in an editorial article, nor perhaps can it be replied to satisfactorily anywhere. The influences which dominate mental training are of such a subtle character that the search be-

comes illusive and conclusions may be warped by misdirected thought. There are, however, certain avenues which may be explored with some degree of assurance of not being led into a labyrinth of metaphysical disquisitions and uncertain conclusions.

Books are the depositaries of the world's wisdom; they can never illustrate its active progress, for as soon as any advance enters into permanent form, embalmed, as it were, in boards and leather, it becomes history, and history is simply the record of dead activities.

When we examine the shelves of our scientific libraries it is with a feeling akin to that with which we observe a collection of antiques. They hold the memorials of a dead past, and are practically of no real use. Each of these tomes has served its purpose. It is a link in the educational chain, but at present is only one piece in the monument erected to commemorate a world's advancement from barbaric thought.

It was said of the late Dr. Atkinson that he rejoiced that he had never been so foolish as to write a book, and it was Agassiz who persistently refused to permit his students to study from books. Both of these prominent laborers in widely diverse fields of investigation were right and wrong. Right in the motive, but wrong in the inference seemingly sought to be inculcated, that books were of no value. Their value in a scientific sense, as it appears to the writer, cannot be overestimated, but the mind that places reliance upon them will fail to grow beyond the parasitical stage, depending for its mental aliment upon the work of others. It must, thus trained, necessarily be in a condition of permanent childhood, advancing only as it is led.

Books are of two classes, original and compiled. The former live by divine right, and will continue to enlighten the world long after their effulgence has been dimmed by more brilliant discoveries. The latter die almost with the issuing. They can only exist as text-books, and as such must be renewed constantly by revision, and then they fail in the end to contain the latest original thought, and are to that extent useless. All are familiar with these two classes. The original production is so rare that its existence may be questioned, yet the truly investigating mind surrounds even old things with a new flavor, and we would not willingly let these die. Then add to these the discoveries of this same thinker, and the work is handed down the ages.

The impossibility of binding the advancing thought of this period in volumes is nowhere more apparent than in our own pro-

fession. It has been repeatedly attempted, but outside of special lines of work it has been a failure. We hand these books to our students with a mental reservation, wondering if we are not doing them a positive wrong in so doing.

All rapidly-growing scientific thought requires an equally rapid medium of transmission. Books are proverbially slow in development. Two or three years in process of growth from the possibly crudely-formed ideas in the author's brain to the hands of the reader is an age in the development of scientific work. This may be well illustrated in the advance made in the study of electricity. Twelve years ago electrical lighting was in its infancy, and the dynamo was to the laity an unknown instrument of power. To-day it is difficult to keep pace with the marvellous developments in this direction. No printing-press is equal to recording them in books, and so astounding are they in some of their phases, that the mind is simply stunned by the momentous possibilities of the future. When these rapid strides in one specialty are considered, how incomparably tame seems the ordinary text-book!

In recent years we have been afflicted with a deluge of small books, and this is doubtless the result of the before-mentioned fact that large books have practically proved failures. In a condensed and frequently-issued form it is presupposed that the student will be amply provided with more recent original investigations. If this idea has had anything to do with their production, it has not been an unmixed success. Condensed thought is rarely satisfactory, whether printed or verbal. There is a happy mean between prolixity and loquacity and sententious and concise expression that but few of us are equal to attaining, and, therefore, the small book is rarely a scientific success, if indeed it be not a misleading production, conducting the untrained mind into confused and impracticable ideas.

The future processes for embalming scientific thought in its most advanced form may be open to conjecture. It cannot be relegated to ephemeral publications. The journals, whether weekly, monthly, or quarterly, furnish an excellent substitute until something better may be devised; yet these can never fill a desired want in educational processes. When the small book is published, covering only one subject, compact and yet full, embracing everything new, and issued yearly, we will have approached, in the writer's opinion, very nearly to the ideal work. Until this be accomplished, we must be satisfied with the cruder educational facilities of the older and slower civilizations.

THE DENTAL PROTECTIVE ASSOCIATION.

ON another page is given a communication from the president of this Association, Dr. Crouse.

The work of this organization has been so positive in good that it seems unnecessary to utter a word in its behalf. Yet the large number of dentists who have failed to join it seems to make this necessary.

The many who still entertain a doubt of its value must be convinced by reading this report that the small fee charged will prove the best investment that can possibly be made.

The promises of this Association for the future indicate a wide extension of its work, so wide that but for the well-known energy of the president we might be disposed to question the possibility of success.

The past work is quite sufficient to prove a guarantee of usefulness for the future, but in order to make this more positive every dentist in this broad land should be upon its books.

THE ETHICAL WAR IN MINNEAPOLIS.

IN the number for March, 1891, we felt it to be a duty to ask the question, "Have we a Code of Ethics?" and in a recent article there was an effort to exhibit the attempts made to advertise, under many and specious disguises.

It has been apparent for a long period, with the self-respecting members of the dental profession, that this state of things would in a very short time result in a conflict of a more or less serious character.

That this was reserved for Minneapolis to commence is somewhat surprising, as it was generally supposed that this city stood pre-eminently as the exemplar in all that was elevated in professional training and ethical culture.

The interest which attaches to this should not be confined to the limit of any one district. It is a very broad question, and cannot be viewed upon any narrow or local basis.

The question whether the Faculty of the Department of Dentistry of the University of Minnesota was in fault is not so vital to the discussion as is that, To what extent can colleges extend their advertising? That colleges must advertise is certain. This is

recognized in all professions, but conceding this, and without any special allusions to the one involved in the controversy, where is the line to be drawn between that which borders on the self-laudatory and egotistical and that recognized as proper and purely for the information of those directly interested? Circumstances must control the decision.

It is a satisfaction to know that there is a large number in at least one society in this country with the moral courage of its convictions, and in which a large minority—perhaps majority—are prepared to defend the ethics of the profession in their locality. If the same determined courage were manifested elsewhere, we would soon find associations, colleges, and individuals ceasing to advertise under the guise of an interview or by any of the questionable methods so common in medical and dental circles, for to do so would mean loss of standing in the profession and community.

While dentists generally cannot enter into the merits or demerits of a local controversy, they can understand the basic principles which underlie this conflict, and should extend a moral support to those who are endeavoring to elevate the work of our calling. To accomplish this there can be no divided interests and no border lines.

Bibliography.

ELEMENTS OF CHEMISTRY AND DENTAL MATERIA MEDICA. By J. C. Cassidy, D.D.S., M.D., Professor of Chemistry and Materia Medica in Ohio College of Dental Surgery. Cincinnati: Robert Clark & Co., 1893.

This work was designed by the author to test "the comparative value to dental students of the two approved didactic methods of teaching chemistry and materia medica,—*i.e.*, by lectures and quiz and by recitations from approved text-books, in connection with suggestive experiments."

This effort to combine chemistry and materia medica in one volume has the merit of novelty, and would seem, upon a theoretical view, a natural course of study. The difficulty has been, and, it is presumed, will always exist, to combine two very extended subjects within the compass of a small book and at the same time satisfy

the critical mind. The author has performed his work in this instance with a considerable degree of success and with a minimum amount of error, but the student will, it is feared, find the necessary condensation, especially in the part devoted to *materia medica*, by no means equal to his needs. The author seems to have regarded this as a possible objection, for he says, in his preface, that "It may appear on first sight that our *materia medica* is too limited and overshadowed by the governing science of chemistry, but the combination of these two branches of our curriculum . . . necessarily prevents the complete exposition of at least those drugs which are unessential in dental practice."

The question of essentials in practice must necessarily be left to each individual teacher, but this branch, it should be remembered, has developed to such an extent in dentistry of recent years that its combination with that of chemistry, in the limits of this volume, cannot give altogether satisfactory results.

The plan of the author, it must be conceded, has a decided value if it be possible to extend it within the limits of a text-book. It is no disparagement, therefore, to say that while this effort does not entirely meet the needs of the student in its present form, a future edition may result in a work free from all objections, and prove of great value in the work of the schools.

Obituary.

AMERICAN ACADEMY OF DENTAL SCIENCE—RESOLUTIONS OF RESPECT TO DR. W. W. ALLPORT AND DR. E. N. HARRIS.

Resolved, That by the decease of Dr. W. W. Allport, of Chicago, the American Academy of Dental Science loses from its list of honorary members one who with unfailing integrity has represented during his long professional life the highest qualities as a sound and progressive practitioner during a most remarkable period in our profession.

Resolved, That we deem his removal a loss not only to ourselves, but to the whole profession in this country and all the civilized world.

Resolved, That this expression be recorded and a copy be sent to his family.

JACOB L. WILLIAMS,

THOS. FILLERBROWN,

R. R. ANDREWS,

Committee.

Resolved, That the American Academy of Dental Science learns with sorrow of the decease of Dr. E. N. Harris, an original member who has given his constant service to the Academy since its formation, during twenty-five years.

Resolved, That his faithful, conscientious, and unremitting labors are deeply appreciated and will be long remembered by his associates in the Society.

Resolved, That the above be placed on record and a copy be sent to his family.

JACOB L. WILLIAMS,
R. R. ANDREWS,
THOS. FILLEBROWN,
Committee.

NEW JERSEY STATE DENTAL SOCIETY—RESOLUTIONS OF RESPECT TO DR. F. A. LEVY.

FREDERICK A. LEVY, D.D.S., born at Richmond, Va.; died at Orange, N. J., March 20, 1893.

At a special meeting of the New Jersey State Dental Society the following memorial and resolutions on the death of Dr. Frederick Arthur Levy were adopted.

WHEREAS, In the death of our esteemed associate, Dr. Frederick A. Levy, the New Jersey State Dental Society has lost one of its most worthy and honored members and one full of generous impulses. He possessed a kindly professional feeling, and was foremost with those who labored to advance the profession by filling its ranks with honorable, capable men. He was a devoted professional brother, sociable, kind, and charitable to an eminent degree. Therefore be it

Resolved, That we bow to the will of Almighty God, and yet desire to emphasize our grief in the death of our professional brother, and to bear testimony to his abilities and self-sacrificing spirit in the advancement of his profession; also,

Resolved, That a copy of these resolutions be spread upon the minutes of our Society, and that a copy be sent to the dental journals for publication.

(Signed) W. F. HOLBROOK,
R. M. SANGER,
J. ALLEN OSMUN,
Committee.

DR. AMBROSE LAWRENCE.

DR. AMBROSE LAWRENCE, of Boston, died April 23, 1893. Dr. Lawrence was the originator of the well-known Lawrence's amalgam. Its introduction in 1851, at a time when amalgams were regarded with no favor, had a tendency to place him in a peculiar position in relation to the active workers of his day; but the dental profession in time changed its opinion entirely in regard to this

material, and probably in a great measure lost some of the feeling originally felt towards those who manufactured and persistently advocated its use.

Dr. Lawrence had his personal peculiarities, but was pleasant socially and professionally, and in former years active in dental associations. He for a long period apparently kept apart from active organizations, and has only been known to the present generation of dentists as the manufacturer of the material bearing his name.

He had reached the age of seventy-seven years at the time of his death, and had continued almost to the period of his sudden transition in active practice.

Domestic Correspondence.

OUR DUTY IN REGARD TO THE WORLD'S COLUMBIAN DENTAL CONGRESS.

TO THE EDITOR:

SIR,—The World's Columbian Dental Congress is at the present time eliciting much interest. Is it possible that misgivings regarding its success are entertained? The query must come home to every one in the dental profession as to whether he or she can afford to have a feeling of uncertainty about a matter which so deeply concerns the dentists of this country. It is at this moment a matter of not the slightest consequence, and one which we cannot now stop to consider, whether those in authority or holding positions of importance or trust were of our own choosing. What we must recognize is, that the time for the meeting is almost upon us, and the only question pertinent is, Are those conducting the organic work equal to the undertaking? Of this there can be no doubt. This question being settled removes it from the field of discussion. The evidence from every quarter now is, that each one feels as they should the importance of sinking all personality, and of moving with a united effort for the accomplishment of the great end or purpose in view,—that is, a profitable, a successful Dental Congress.

Individuals in their rational thoughts and actions have always in view one of two objects,—either gaining something or being something. The former can only be realized by somebody having something to give, and since each expects to be a gainer by the

acquisition of either knowledge, honor, pleasure, or friends, so should each and all be as earnest in the desire that every other one should be to this extent richer for the Congress having been. But this can only be by each one contributing something or being something, as well as receiving something. There is scarcely any one so humble or so obscure in our profession but that upon some subject, or in some manner, he or she can crystallize a thought or an act which will prove useful to some other one in the same industrial line. The meetings of the Congress are not to be ideals in profit because of long dissertations on any one subject, but by terse, pithy, well-condensed thoughts on a variety of subjects. The *Dental Cosmos* editorial for April strikes the key-note when it virtually says diametrically opposite views are held on many important questions or subjects: "The opportunity of having and hearing these discussed by the ablest thinkers in dentistry from all parts of the world must have a decided value in enabling us to arrive at a better and more accurate judgment upon the issue than would be possible under less favorable circumstances or by less efficient means." Every one has a degree of intelligence, of interest and of will to make the Congress a grand success, and it is only necessary that these be exercised for the good of others, leaving out of the question, for the time, the matter of profit or return to himself, though that will necessarily come, just as surely as the sunshine follows the shower, and the richer, more delightful, will it be when secured.

I have great faith in individuality when governed by its best motives, and under what other circumstances could such an opportunity be afforded for so rich a harvest,—every one to be truly himself in the spontaneous exercise of his intelligence, his wisdom, his interest?

The aim of the Congress, as already expressed in the issued circulars, is to gather together the evidences of the material, as well as the intellectual, progress and achievements of civilization. As a result of such an aggregation every department of human endeavor can be studied, and all who avail themselves of the opportunity may be benefited.

The thinkers and workers of every department will be those who constitute the World's Columbian Exposition. Is dentistry so handicapped by jealousy and factional strife that it cannot, equally with other professions, derive the much-valued and needed advantage which will be offered? I trust not. The interchange of ideas, methods, theories, and practical experiences is just as much needed in our profession as in any other department. Nor is there any

occupation where greater benefit can be secured by such intercommunication than in our own specialty. Dentistry, truly regarded as an important department of the healing art, is in this country in its infancy. What method could be adopted which would more certainly broaden our understanding and substantially strengthen our foundations than a free interchange of thought with our English, French, and German brethren?

C. N. PEIRCE.

THE DENTAL PROTECTIVE ASSOCIATION OF THE UNITED STATES.

TO THE EDITOR:

SIR,—We herewith send you an account of the Dental Protective Association, showing what we have done, what we are doing, and what we expect to do for each one who belongs to the Association.

First.—We have freed the dental profession from annoyance or from paying royalty to the International Tooth-Crown Company for the past four years. We have also stopped twelve or thirteen other patent companies from collecting and canvassing for royalties.

We have thus saved the dental profession a million dollars a year; for, without the protection given by this Association, every practitioner in the United States would have been compelled to pay royalty on some of the numerous patents owned by these companies, and there are in the United States between sixteen thousand and eighteen thousand dentists. It has saved each practitioner not less than one hundred dollars annually for the past four years. So much for a very brief summary of what we have done.

Second.—We are defending, at present writing, suits brought against our members in Indiana, Michigan, Ohio, New York, Connecticut, and Colorado. We are having one important test suit with the International Tooth-Crown Company on the Low Bridge patent. This suit has been in process of preparation for over two years, and has required a large expenditure of money, time, and energy.

Members of the Dental Protective Association have been sued during the last year for an infringement of letters-patent granted C. H. Land on what is known as "Inlays."

The chief part of this patent consists of the taking of an impression by burnishing either platinum or gold into and accurately around the edges of the cavity, thus forming a matrix, and then

filling this matrix with porcelain or some substance which is melted into it. The plug thus made is secured by cement.

I should be much pleased to have a detailed statement from all members of the profession who practised this method prior to 1886.

Again, we examine *all* patents in which our profession is interested, and constantly give information to members of the Association on patent claims, thus saving them from paying royalty on unjust patents.

We are now investigating the various remedies and methods for painless dentistry, and we shall be prepared to give to all our members the secrets and analysis of the remedies by the time this circular reaches them.

Thus far in the history of the profession a dentist's expenses have necessarily been out of all proportion to his income; but a new era is before us, and soon, we trust, it will not be necessary for a dentist to wait five years before he can save ten dollars to join the Dental Protective Association.

The work of the Dental Protective Association of the United States has been so entirely successful, and has been carried on with such *apparent* ease, that the profession at large, and even the members, I am led to think, but faintly realize the amount of time and labor it has involved during the five years since its organization.

The defence of the suits brought by the International Tooth-Crown Company alone has necessitated taking the testimony of nearly one hundred witnesses in all parts of the country, each of whom has been secured by the chairman, who has also been present at their examination. Besides this, the vast numbers of letters written, the thousands of miles travelled, the weeks of time given in attending public meetings, examining patents, securing witnesses, defending suits of members, etc., etc.,—all this has been given freely and cheerfully, but, let it be distinctly understood, without one dollar of compensation; on the contrary, in the beginning of the organization the chairman not infrequently used his own funds in defraying expenses.

This explanation is made in order that no one may hesitate to join through fear that his membership fee may be spent in paying salaried officers or benefiting the management.

BENEFITS OF THE DENTAL PROTECTIVE ASSOCIATION.

It saves the profession millions of dollars.

It saves its members time and annoyance from the visits of patent claimants.

It saves its members the time, the worry, and the expense of defending their own suits.

It wins their suits when they, individually, would fail.

It examines all dental patents and gives its members the benefit.

It examines new remedies and methods and gives its members the process free.

It furnishes its members (or will soon) materials at about one-half the usual prices.

It furnishes membership in the Association for *ten* dollars.

It has no annual dues or assessments.

Does it pay to be a member of the Dental Protective Association?

All communications should be sent to

J. N. CROUSE,
Chairman.

CHICAGO, April 27, 1893.

Notes and Comments.¹

ONE of the best measures of the progress of man is the degree of his ability to stand alone, in thought and action, undisturbed, though he may often profit by the adverse opinions and judgments of others. "When the people are a herd they are easily swayed and ruled by one man; when they are individualized, the dominion of one is not possible." Let us hold, then, and teach that better than great riches and possessions is a brave heart, an enlightened and well-balanced mind, an appreciative, hopeful, and helpful soul. Let our labors be a sort of religion, urging us to elevation, seriousness, and chastity of thought and actions.

To quote from Charles Kingsley: "Men can be as original now as ever, if they had but the courage, even the insight. Heroic souls in old times had no more opportunities than we have; but they used them. There were daring deeds to be done then,—are there none now? Sacrifices to be made,—are there none now? Wrongs to be redressed,—are there none now?"

¹ The assistant editor solicits contributions for this department,—new methods, new remedies and formulas, or any short practical note which may prove of value to the practitioner or student. Address 1506 Arch Street, Philadelphia.

IMPLANTATION.—While discussing a paper by Dr. Younger upon "Some of the Latest Phases in Implantation," Dr. George S. Allan made the following pointed remarks:

"No biologist of the present time questions the law, *omne vivum ex ovo*, nor would he hesitate longer to give his support to the assertion that no dead matter, though once living matter, can again become living matter except through a process of digestion and assimilation through a living body. Such a thought as that Dr. Younger suggests—that a mass of dead matter can, as you might say, without breaking bulk or altering shape, become again living matter—would only excite laughter or derision in the mind of the true student of vital powers and conditions and their origin.

"I wonder that Dr. Younger did not submit his paper to some one having correct knowledge of the fundamental biological laws he would overturn in his anxiety to sustain a false position,—a position, by the bye, not at all necessary to assume in order to support his well-merited claims in bringing to new life the possibilities of the system of implantation."

THE CLUMSY DENTIST.—Among other good things, friend Welch, in the editorial pages of the *Items of Interest*, says,—

"How clumsily the blundering dentist stumbles along in his difficult work, seeking unmerited success. He complains of his awkward instruments and of his fractious materials,—of the unmanageableness of everything but himself. They do not obey him because he does not know how to command them. He is the servant of circumstances and the master of nothing. How he fumes and frets at his hard lot, when he ought to see that *he is only spoiling a good ploughman to make a poor dentist.*"

"THE COBALT OF HERBST."—After making numerous experiments with the material, Dr. E. C. Kirk says, "It is unquestionably a fact that the cobalt of the Herbst method for treating pulps is not what is now known to chemists as cobalt, but pure metallic arsenic, and nothing else. Whether the cocaine hydrochlorate, of which eight per cent. is added, has any function apart from its usual anæsthetic property, is not clear, but it may easily be that it is to a certain extent decomposed, giving up its chlorine to a portion of the arsenic, and so forming an arsenic chloride which, being soluble, would be more readily absorbed by the pulp. It is also

possible that the free acid which most of the samples of cocaine hydrochlorate are said to contain may also help to increase the solubility of the metallic arsenic. Be that as it may, it is well for us to recognize, before adopting this method, that whatever of value it may have is due to the effect of arsenic, and not in the remotest degree to cobalt.

"As to the effects of arsenic upon an exposed pulp the dental profession are pretty familiar. How far they may be modified as to the final result by using metallic arsenic instead of its oxide remains to be seen, but it does not seem difficult to guess."

Current News.

CHANGE IN TIME—AMERICAN DENTAL ASSOCIATION.

TO THE EDITOR OF THE INTERNATIONAL DENTAL JOURNAL:

SIR,—Owing to a change in the time of meeting of the World's Columbian Dental Congress, it seemed a necessity to make a change in the time of meeting of the American Dental Association, and at the request of the officers of both the American Dental Association and the World's Columbian Dental Congress, I communicated with the officers of the former, and the vote was unanimous for changing the time of meeting.

Accordingly we give notice that the meeting of the American Dental Association will be held in Chicago, August 12, instead of August 15.

By order of the Executive Committee,

J. N. CROUSE,
Chairman.

CHICAGO, April 17, 1893.

RECENT PATENTS.

A LIST of recent patents, reported specially for the INTERNATIONAL DENTAL JOURNAL:

490,637.—Dental Chair. Maguler Butler, Rochester, N. Y., assignor of one-half to the Archer Manufacturing Company, same place. Filed February 15, 1892.

490,930.—Dental Machine for Grinding Artificial Tooth-Crowns. Rufus G. Stanbrough, New York, N. Y. Filed March 15, 1892.

491,097.—Dental Chair. Aaron P. Gould, Canton, Ohio. Filed April 16, 1888.

491,098.—Dental Chair. Aaron P. Gould, Canton, Ohio. Filed January 17, 1890.

491,099.—Dental Engine. Aaron P. Gould, Canton, Ohio. Filed May 31, 1892.

491,464.—Surgical Forceps for Dental Use. Charles E. Blake, Sr., San Francisco, Cal. Filed November 6, 1891.

491,499.—Angle Attachment for Dental Engines. Samuel P. Sharp, Knoxville, Tenn. Filed July 26, 1892.

491,514.—Dental Forceps. Charles E. Blake, Sr., San Francisco, Cal. Filed June 27, 1892.

491,515.—Dental Forceps. Charles E. Blake, Sr., San Francisco, Cal. Filed June 27, 1892.

491,516.—Dental Forceps. Charles E. Blake, Sr., San Francisco, Cal. Filed June 30, 1892.

491,517.—Dental Forceps. Charles E. Blake, Sr., San Francisco, Cal. Filed June 30, 1892.

491,518.—Dental Forceps. Charles E. Blake, Sr., San Francisco, Cal. Filed June 30, 1892.

491,519.—Dental Forceps. Charles E. Blake, Sr., San Francisco, Cal. Filed July 26, 1892.

491,610.—Bracket for Dental Chairs. Dewell Stuck, Rochester, N. Y. Filed March 19, 1892.

491,611.—Dental Chair. Dewell Stuck, Rochester, N. Y. Filed March 19, 1892.

491,932.—Dental Forceps. Alma Whitlock, San Bernardino, assignor to Charles E. Blake, San Francisco, Cal. Filed August 2, 1892.

THE WORLD'S COLUMBIAN DENTAL CONGRESS— SPECIAL NOTICE.

TO THE OFFICERS OF DENTAL SOCIETIES IN THE UNITED STATES
AND FOREIGN COUNTRIES:

The Committees on Membership and Registration of the World's Columbian Dental Congress will be saved much trouble, and the applicants for membership much vexation, if the members of Dental Societies in good standing are furnished with credentials

or certificates of membership, so that they may be presented at the desk where intending members apply for their membership cards.

Advanced membership cards will be furnished on application to the Secretary of the General Executive Committee, or the Secretary-General of the Congress, when the membership fee (ten dollars) accompanies the application.

A. O. HUNT,

*Secretary of the General Executive Committee,
Iowa City, Iowa.*

A. W. HARLAN,

*Secretary-General of the Congress, 1000 Ma-
sonic Temple, Chicago, Ill.*

COMMITTEE ON EXHIBITS, WORLD'S COLUMBIAN DENTAL CONGRESS—IMPORTANT NOTICE.

THE Committee on Exhibits for the World's Columbian Dental Congress desires to obtain rare specimens of growths, abnormalities, casts, illustrations of methods, instruments, and appliances, both ancient and modern, whereby the growth of the profession may be shown from its early infancy up to the present time. They also desire to exhibit an ideal library, operating-room, and laboratory, and to this end earnestly request all members of the profession, together with dental dealers and publishers, to loan them any specimens, instruments, appliances, books, photographs or pictures of societies and eminent men of all countries, together with anything and everything that will be of interest to any dentist from any part of the world. They will pay all transportation charges on such exhibits to Chicago and return, and will insure the same while on exhibition, if desired.

COMMITTEE.

Charles P. Pruyn, Chairman, 70 Dearborn Street, Chicago, Ill.; Arthur E. Matteson, 3700 Cottage Grove Avenue, Chicago; E. M. S. Fernandes, 36 Washington Street, Chicago; M. L. Rhein, 104 E. Fifty-eighth Street, New York City; A. W. McCandless, 1001 Masonic Temple, Chicago; R. C. Young, Anniston, Ala.; James Chace, Ocala, Fla.; W. A. Campbell, Gold and Fulton Streets, Brooklyn, N. Y.

Address all communications to Dr. A. W. McCandless, Secretary, 1001 Masonic Temple, Chicago, Ill.

PENNSYLVANIA STATE DENTAL EXAMINING BOARD.

THE Pennsylvania State Dental Examining Board will meet for the transaction of business at Cresson, Pa., on Tuesday, July 11, 1893, and will continue in session for one day only.

W. E. MAGILL, Erie, Pa.,
President.

J. C. GREEN, West Chester, Pa.,
Secretary.

CALIFORNIA STATE DENTAL ASSOCIATION.

THE next annual meeting of the California State Dental Association will be held in San Francisco, Tuesday, June 13, 1893, at the rooms of the Dental Department of the University of California, corner of Taylor and Market Streets, continuing four days. All members of the profession are invited to be present.

W. Z. KING, 1001 Valencia Street,
President.

L. VAN ORDEN, 14 Grant Avenue,
Recording Secretary.

SAN FRANCISCO, April 22, 1893.

THE MISSOURI STATE DENTAL ASSOCIATION.

THE Twenty-ninth Annual Meeting of the Missouri State Dental Association will be held at Excelsior Springs, Missouri, July 11, 12, 13, and 14, inclusive. All dentists are invited to attend, as the meeting promises to be of great value to the profession.

WM. CONRAD.

321 N. GRAND AV., ST. LOUIS, MO.

THE International Dental Journal.

VOL. XIV.

JULY, 1893.

No. 7.

Original Communications.¹

CROWN- AND BRIDGE-WORK.

BY DR. C. M. RICHMOND, NEW YORK.

(Continued from page 164.)

FOR using hot air for dental purposes, such as treatment of sensitive teeth, drying roots and root-canals previous to filling or crown-setting, various devices have been put forward having more or less to commend them, but the *ideal* device is yet to come. I have perfected one which has given more satisfaction than anything heretofore shown, and after a practical test of the one illustrated, I found that Dr. S. G. Perry, of this city, had made the same device in all its details, except the use of carbon, and with the same end in view. I found in my previous hot-air device (which was a hot platinum point through which the air passed) that though the first blast of air was of the required temperature, it at once cooled, while the platinum point was still hot. A blast of air would form a centre draft, and the hot air not being expelled, the cold air would make its way in its rapid passage through the hot air. This led to making a device which would cause the hot as well as the cold air to turn corners and thus keep perfectly commingled. The result is *perfect*, as a very hot blast of air and one of three or four minutes' duration is produced; so that one heating of the instrument is all that is required for an operation.

Referring to the cuts, Fig. 1 is an exterior view of the device in

¹ The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

full working size as I now use it, Fig. 2 is a cross-section near one side, and Fig. 3 represents the interior of the shell or case as it would appear if opened or made of metal; but I use for the cylinder a piece of hard round carbon having holes furrowed through it, as shown in Figs. 2 and 3; each end of the said carbon cylinder is capped with metal caps, as shown, and lined inside with disks of asbestos, which are cemented upon the ends of the carbon to hold them in position. The inlet and outlet tubes are made of metal and extend through the caps, as seen in Fig. 2, and are fastened by soldering or brazing. The nozzle may be made of platinum, if desired, and curved, as shown in Figs. 1 and 3. The inlet tube for the air is provided with a screw-thread to connect with the bellows or hand-blast, as most convenient. To give the desired heat for the air, I place the carbon cylinder, as shown in Fig. 1, in the flame of a Bunsen burner, and then it is or may be raised to a *red heat*, and as the air is forced through the curved passages, as shown in Fig. 3, it is thoroughly intermingled and perfectly completes the operation.

In Fig. 4 I have illustrated a piece of bridge-work for replacing the bicuspsids and retaining the pulp alive in the cuspid as well as the molar tooth. The cuspid had been badly worn as well as all of the six front teeth. They were restored by contouring. In operating on the cuspid I cut with a small drill two holes on either side of the pulp-chamber to the depth of one-eighth of an inch. I then burnish a piece of pure gold, No. 30, over the end of the tooth, and the place where the two holes are will be marked in the pure gold. I then punch the holes where indicated and place through them a couple of tapering platinum pins, made for the purpose, and wax all together with a drop of hard wax. I now place it onto the tooth and crowd it down to position, forcing each pin as far as it will go into the holes and fitting the gold as near as possible. The piece is now invested, and the two pins are caught with a small piece of solder, just enough to hold them in place so as not to stiffen the piece of pure gold, which now has to be perfectly fitted to the end of the tooth while the pins are in position. I now put the piece in place, and with an automatic mallet and a foot-plugger (Butler's large preferred) the edges of the pure gold are set to fit the tooth-end perfectly. I now invest again and build up with solder to the required point. The gold molar having been fitted, the two porcelain teeth ground and waxed into position, and the gold tip placed onto the tooth, an impression of the case is taken with investment material (marble dust and plaster, equal parts, with a little salt added), and after it has hardened I remove it and place the parts in the

FIG. 1.

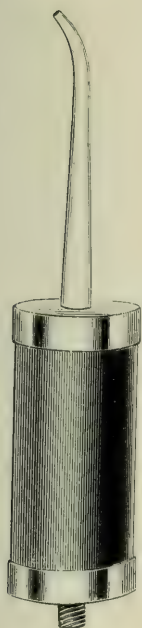


FIG. 2.



FIG. 3.

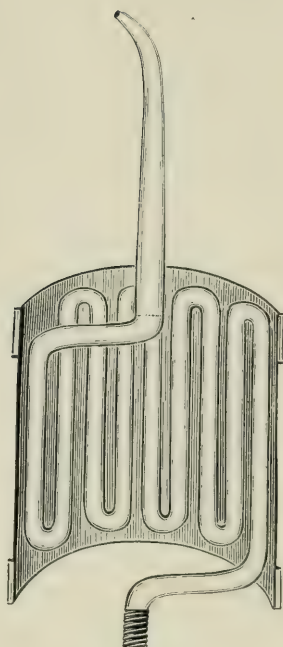


FIG. 4.



FIG. 5.



FIG. 6.



impression and cover with more of the investment. The whole case is now covered, and with a knife I cut into and expose the places where I wish to solder. After the case is finished I dry all the parts and the teeth and fill the two small holes in the cuspid; also fill the gold crown with sufficient cement to answer the purpose, placing the piece in position and forcing firmly home. After the case is cemented in position this gold tip is as perfect in appearance as if built on with gold foil and a mallet, and is much stronger, and will support one end of the small bridge perfectly, as shown in Fig. 4. In Fig. 5 I have illustrated a new porcelain crown for plate- and crown-work. This crown has a post or pin baked into it, and at the base of the crown are two diverging wings of platinum coming to the surface, as will be seen by referring to the cut. This tooth can be ground onto a plate or crown, and at once waxed into position and invested and soldered, without having to back with gold. A knife-edge of gold runs up into the split pieces of platinum and is attached to the crown or plate in the form of an oblong pyramidal shape, and instead of backing a tooth with a plate of gold, which robs it of its translucency, the gold runs direct into the tooth and supports it in the proper direction, thus saving a great expense and also much time and labor in backing and finishing.

Fig. 6 shows one of the new teeth attached to a band-crown, showing how small a piece of gold has to be finished after soldering. This tooth marks the first practical advance in porcelain teeth for crown- and plate-work for years, and is the most practical and strongest tooth yet made. It will be used at Chicago in giving clinics at the World's Columbian Dental Congress.

(To be continued.)

THE DISADVANTAGE OF HIGH-TENSION CIRCUITS FOR DENTAL WORK, AND HOW THEY MAY BE ALTERED TO CIRCUITS OF LOW POTENTIAL, SUITABLE FOR DENTAL OPERATIONS.

BY DR. PETER BROWN, MONTREAL, CANADA.

THE tendency of central stations to increase the potential of their power-circuits raises a new complication in the application of electricity to dental practice. In the first place, it increases the dangers of the operator and patient getting a shock from accidental

contact with exposed parts of the apparatus; then it necessitates the putting of lamps or resistance-coils in the circuit, in order to reduce it low enough to render it safe to use about the mouth; this involves additional expense for rheostats and resistance-lamps, and complicates the wiring.

The usual voltage of power-circuits is now from two hundred and twenty to five hundred volts; it depends in some cases on the distance to which the line is carried from the central station, and in others on the use to which the circuit is put. For stationary motors the two-hundred-and-twenty-volt circuit is usually used, and street-railways use the five-hundred-volt circuit; either of these may be economically transformed into low potential circuits, which can be safely used in all operations where electricity is indicated, or where it is desirable to use it for motive-power.

The method used by the writer is as follows: A half horse-power motor, running off a two-hundred-and-fifty-volt circuit, is belted to a counter-shaft; this shaft runs a quarter horse-power, one-hundred-and-ten-volt dynamo, and a sixth horse-power, ten-volt dynamo. In the first dynamo we get a current of two and a half ampères at one hundred and ten volts potential, and in the second a current of ten ampères at ten volts potential. Two sets of wires are led from this miniature central station, which is placed in the basement of the office, to the chair where the one-hundred-and-ten-volt current is used to run a dental engine motor, a lathe motor, and a fan which is used on warm days to keep the air in circulation. The current from the ten-volt generator is used to run the electric mallet, mouth-lamp, root-dryer, cautery, and gold annealer. By this arrangement the two ampères of current which enters the office at a potential of two hundred and fifty volts is transformed and divided into a current of ten ampères at ten volts potential, and a current of two and a half ampères at one hundred and ten volts. Without this means of transforming the power it would be a difficult matter to use such a high-tension circuit as two hundred and fifty volts to heat a cautery or to use it for a root-dryer or mallet. Where one has to pay for his electric power by meter, it would cost a great deal to use it for cautery purposes, as the heating power of a current depends on its quantity or number of ampères, and not on its potential or number of volts, and it is the ampères we pay for. To use a current of two hundred and fifty volts, we would have to put five fifty-volt—sixteen-candle-power—lamps in series, then we would get a current of one ampère, and the voltage of the current would be very much reduced; but this involves a great waste of energy,

as we are expending the greatest part of the current in producing light which is not wanted at the time, and we have the additional expense of maintaining lamps. If we want a greater current than one ampère, we remove the sixteen-candle-power lamps and put in thirty-two-candle-power lamps instead; this will give us two ampères; and we can go on increasing the quantity indefinitely until the maximum capacity of the circuit is reached by using several banks of lamps. This is one method of reducing it, and it is usually the most satisfactory. The fifty-two-volt alternating circuit may be adapted for cautery purposes by a small converter; a current of two ampères, at fifty-two volts, can be transformed into a current of ten ampères and five volts.

There is now on the market a machine called a motor-dynamo or direct-current transformer, made by the Crocker-Wheeler Electric Company of New York. It consists of a motor with a double-wound armature; one side is made to receive a high-pressure current, the other to give it out at a low pressure. The idea is the same as mentioned in the beginning of this article, only that the motor and dynamo are on one shaft instead of being connected by means of counter-shaft and belt. A machine of this kind would be the proper thing for our purpose, as we could have one made to receive any current which might be convenient for us to work from, and give it out at any pressure we might decide on, say ten volts. We could then contract for one ampère of current at two hundred and fifty volts, or half an ampère at five hundred volts, or two and a half ampères at one hundred and ten volts. Either of these would give us a quarter horse-power; the dynamo side of the machine would then give us twenty-five ampères at ten volts, or two hundred and fifty watts; and this is just what we want,—as was mentioned before, a current of low pressure and large quantity. This machine can be placed in an adjoining room, or on a shelf in the basement, or in any convenient place. As it is almost noiseless in its action, it could be placed in the office, provided that it could not be interfered with by curious people, although their curiosity might receive a check if they got hold of the primary or high-pressure side of the apparatus. Once the apparatus is installed, we have nothing to do but turn the handle of the starting-box and leave it alone until we are through for the day. It will take care of itself. The wires from the dynamo side are brought to the chair and connected with our apparatus; for the engine we can have a one-eighth-horse-power ten-volt motor with its regulating-box or rheostat; this will require about ten ampères to run it, according to

the work we give it to do; then we have still fifteen ampères to draw on for any other purpose we may wish to use it for, and we are absolutely safe from shock.

Another method of transforming a current is to use storage batteries. We can connect the battery to the power-line and put in suitable resistance, and take our power from the battery as we require it. This is not so satisfactory as using a motor-generator, but it is mentioned so that one can use it if he wishes.

If one is so situated that he cannot get power from a direct current, but can get the alternating current, it may be used by putting in an alternating-current motor of a half horse-power and belting it to a direct-current dynamo wound for any voltage we may desire to use; fifteen volts should be about the maximum voltage used about the dental chair. Alternating-current motors of one horse-power are now on the market. A motor of this class of about one-half horse-power would be ample for all the requirements of dental work. So far small motors for the alternating current have not been a success, and it cannot be used for the electric mallet at all, no matter how we reduce it; but it may be used very satisfactorily for cautery work by having a small converter made by which we could change a current of fifty-two volts and two ampères into one of ten ampères and ten volts; the number of watts remains about the same,—that is, one hundred, allowing a loss of four per cent. in the converter.

THE VALUE OF POST-GRADUATE INSTRUCTION.¹

BY G. LENOX CURTIS, M.D., D.D.S., NEW YORK.

MANY of you will doubtless recall the fierce attack upon the dental colleges made by the Philadelphia *Medical Times* some years ago, in which the editor (Professor H. C. Wood) stigmatized their degree "D.D.S." as the "badge of a partial culture." You will recall also how the late Dr. J. W. White, who took up the cudgels for the dental schools, showed from Professor Wood's own testimony that they were at least doing what they claimed to do,—grounding their students in the principles of dental practice,—which, if the same witness was to be believed, was a good deal more than could be hoped for from the medical colleges of the day, notwithstanding

¹ Read before the Central Dental Association of Northern New Jersey, March 17, 1893.

the *Times* held them up as the only proper educators for practitioners of dentistry as of any other specialty in medicine.

The sense in which the *Times* used the phrase "partial culture" was that the dental college could not, *per se*, fit a student for the practice of dentistry, because it did not and could not give him the proper medical knowledge. It is not necessary now to enter into the merits of that contention, but there is a broader sense in which the D.D.S., when granted even after the most thorough course of instruction enforced in any dental college, is the "badge of a partial culture." But it is no more so than is the M.D. of the callow medical graduate, the diploma of the unadmitted law-school fledgling. Each of these bears testimony to the fact that its holder has passed the required curriculum of study. The young dental graduate, for instance, has been taught the general principles of practice, but his time has mostly been occupied in acquiring knowledge, so that when graduated he is merely ready to learn how to apply that knowledge. He is, however, extremely ready, his training having made him apt in the absorption and application of methods. As Dr. Kirk puts it, "The most that has been absorbed when the diploma has been won is a knowledge of the more important principles, a familiarity with typical methods, a limited facility in technique, and, what is equally important, if not more so, the establishment of a habit and method of study giving the ability to readily acquire further knowledge and practically apply it as occasion arises."

The bare statement of the acquirements of the recent graduate testifies his need for further study. He is ready to "begin" practice, of course, but who will say he is prepared to cope with the complicated conditions which, common enough in their occurrence, yet test the resources of even the skilled practitioner? Of theoretical knowledge there is no lack. So far as this phase of his qualifications is concerned, the recent graduate can almost surely pass a better examination than his more skilled brother of twenty years' active practice; better fourfold than he himself can when twenty years of active work have made him a shining light in his profession. What he stands most in need of now is the fertility of resource, the keen discernment, the accurate diagnosis, the trained judgment, and, most of all, the manual dexterity, which twenty years of active practice will give. How shall he conquer these, so that patients at the outset of his career shall have as useful service as they will receive at his hands twenty years after? It is most of all in the face of this lack that his D.D.S. is the "badge of a partial culture."

Dr. S. B. Palmer, in a paper published in the *INTERNATIONAL DENTAL JOURNAL* for February, states the weakness of college instruction when he says, "There is not sufficient time spent with students in manual training to enable them to meet the requirements of prosthetic dentistry; so when they graduate they have made one or two practical dentures and from twelve to fifty fillings in all."

How is this to be remedied? There seems but one answer,—by the post-graduate school. Extension of the term of studentship has done much to correct evils formerly existent in our scheme of education. There is now no lack of theoretical knowledge of the science of dentistry in the average graduate. His greatest weakness is in the direction of manual dexterity, which, after all, stands very near the first essential to the practical dentist. A fourth year in college, of exclusively clinical and practical work under the guidance of skilled instructors, would meet the difficulty to a large degree; but even then the student would not have sufficient opportunity to decide certainly what particular line of work he would wish to follow, and as no man can be an expert in all things, a year or two of private work would be required to show him what he really needed, when the post-graduate school would afford the means to supply his wants.

Then, again, there is that large class of men who have entered upon practice without the advantage of a college training. Many of these would be eager to avail themselves of the opportunities for practical instruction to be found alone in a properly-conducted post-graduate school or practitioner's course.

If dentistry hopes to maintain the dignity which it now claims, it must lay out a course of clinical study covering the higher grades of work, to be taught by men having the requisite knowledge and the ability to impart it. By this means the average ability of the profession at large would be sensibly increased. Not every man who is perfectly competent to deliver a lecture before a class of raw students is fit to demonstrate the fine arts of delicate manipulation before a body of graduates and practitioners. These do not sit in open-mouthed wonder as at revelations of an occult science. They are prepared to question whatever is not clear, and they test with more or less keenness the practicality of what is offered. Their instructor must needs know his subject thoroughly, must not merely be "up" in its present development, but must be familiar with the steps by which that development has been reached, even the errors which experience has demonstrated; in a word, he must be a real

expert in the particular branch he essays to teach. Dentistry does not lack for such men. What it does lack is the opportunity and the means to avail itself of their knowledge, their skill, and their willingness to give of their store to the general stock of knowledge, which the general establishment of post-graduate schools would make available. Indeed, in view of the importance of the subjects involved, it may be a question whether attendance upon post-graduate instruction should not be made obligatory upon all graduates.

Men whose good fortune it has been to take a course or courses in post-graduate work are loud in its praises. It is well to read in the journals descriptions of practical methods of procedure; well to hear them discussed in society meetings. It gives one food for thought, broadens the mind, perhaps suggests new ideas. But the moral effect is as nothing compared with seeing every step of the operation, and then under the eye of the instructor doing it one's self. It gives one confidence in himself, a state which always inspires the confidence of his patients.

In these days, for instance, no dentist can be accounted an all-round, finished workman who does not possess a thorough knowledge of crown- and bridge-work. Yet it is safe to say not four per cent. of practitioners have this knowledge. Many more think they have it; but they judge from a biased stand-point,—their own work, not that of experts. To acquire this knowledge requires special training, without which the proper practice of this important branch of our work is impossible to the great mass of dentists. Its importance will be the better recognized when we reflect that it is the agency which is rescuing prosthetic dentistry from the low estate into which the introduction of vulcanite plunged it. Were it for no other reason than to assist in this rehabilitation in the esteem of all men of a once-honored department of dental practice, the knowledge of the principles and procedures of crown- and bridge-work should be universal. Since the introduction of this beautiful work we hear less and less of the one-time shibboleth, "I do no mechanical work," by which the sheep of the profession sought to distinguish themselves from its goats.

Few men fresh from college are able to construct a bridge properly; fewer still—and this applies also to the mass of practitioners—can do any real surgery in the mouth. The reason why is suggested by Dr. Palmer's remark before quoted. Most of the difficult work, such as surgery, bridge, and continuous gum, in the colleges is done by the professors or the demonstrators; so that a practical knowledge of more than the simplest operations is too

seldom obtained. In a properly conducted post-graduate school a vastly different rule prevails. It should be manned by competent instructors, experts in each branch such as I have previously described, who would be there to teach, not to practise; to show those sitting under him how to do and then supervise their efforts to do. That is the kind of instruction which is now mostly required to elevate the standard of dentistry. Rightly carried out it will place the schools upon the highest level which can be demanded of them.

To sum up its advantages, the post-graduate school brings the man who seeks it for instruction into close contact with greater men, suppresses his egotism, broadens his intellect, draws forth his noblest qualities, and inspires his highest ambitions; fosters his inventive faculty and instills into him a reverence for science; in a word, it places within the reach of every man who will learn a practical knowledge of the highest development of dental procedures, and by so much advances the true interests of the profession and of the race.

I have said that it is a question whether post-graduate work should not be made obligatory upon all graduates. I am persuaded that the experiment of a post-graduate school, founded upon the lines herein indicated and conducted with an eye single to the advancement of those in attendance, would, by its results, so react upon the moral sense of the profession as to make the post-graduate course, or its equivalent, a necessary preliminary to entrance upon practice.

TREATMENT OF PYORRHOEA ALVEOLARIS.

BY JAMES TRUMAN, D.D.S.

IN compliance with a desire often expressed, the following method, adopted by the writer, is given in as brief a manner as possible. It has no claim to originality, except in the use of two agents,—bicarbonate of soda and sulphate of quinine.

Abandoning all theories in regard to its etiology, the operator is asked to consider the state of the tooth and adjacent tissues. The tooth affected responds to a jar with a dull pain, indicating pericemental inflammation. The gum is loose and flabby. A probe indicates a pocket of varying depth. Calculi may possibly be found adherent to the cementum, not by any means a usual condition. Pus is manifested on pressure of the gum.

These being the representative diagnostic signs, the treatment resolves itself naturally into three distinct stages, which may arbitrarily be separated into primary, secondary, and permanent.

The *primary* is to remove all sources of irritation. This is accomplished, first, by the use of antiseptics and escharotics. (a) Hydrogen peroxide, followed by (b) mercuric chloride solution (1 to 2000). (c) Saturation of the pocket with commercial sulphuric acid, twenty-five-per-cent. solution. This is applied with a stick sharpened to the form of a chisel, carrying the acid down on all sides. The aromatic sulphuric acid is not adapted to this, as it fails in strength and contains undesirable ingredients. This is followed in a few moments by (d) an antacid, bicarbonate of soda preferred; making this into a magma with water and packing it in the pocket. The ebullition produced cleanses and also neutralizes all acid present.

The *secondary* is the filling of the pocket, on the conclusion of the primary treatment, with some agent which will prevent, for at least twenty-four hours, the development of pathogenic germs, and give time for natural processes in the formation of new tissue. This demands an antiseptic, readily formed into a paste and one not easily washed out. Very few agents are suitable for this. Aristol and quinine may be regarded as the best. The writer prefers the latter, for reasons not necessary to dilate upon here. The case is then left to be seen at a subsequent sitting,—the second or third day.

Upon the return of the patient the pocket is washed out with warm water and examined. If calculi be present, they are to be removed. Further treatment with any form of escharotic is not advisable. The quinine should be renewed, and the patient given the following mouth-wash, with instructions not to omit it a single day:

R Hydronaphthol, gr. xx;
Alcoholis,
Aquæ, aa ʒi. M.

Sig.—Half a teaspoonful of the above to a small tumblerful of water; to be used twice a day,—morning and before retiring at night.

The case can then be examined from time to time, but the antiseptic wash must be continued indefinitely. Upon this will depend the success of the treatment. Any omission will be certain to cause a relapse, as it is rarely possible to close entirely the pockets, and, unless they are kept aseptic, inflammation will be renewed. This latter constitutes the *permanent* treatment.

The philosophy of the method thus briefly outlined is based on

the fact that, let the origin of this pathological condition be what it may, whether, as some assert, by systemic disturbances or, as others affirm, by purely local irritation, the incipient stages are marked, first, by inflammation at the gingival border, followed by rapid development of micro-organisms. It is evident that these pathogenic germs must be removed before any further effort be made.

This accomplished, other conditions may be considered. Calculus, if present, will be found to be a secondary product, adherent to the cementum, to be removed by scalers. This deposit holds, in the estimation of the writer, but a minor part in the irritation. The removal, combined with the antiseptic treatment, prepares the way for the use of a gentle escharotic. The object of this is to burn out any dead material present, giving the subjacent healthy tissues an opportunity to perform their normal function of restoration. This acid action should be only temporary, hence the use of an antacid to antagonize its possible destructive effects.

To accomplish a restoration of parts, protection from external influences must be secured. If this be not attended to, all the primary treatment becomes useless. This is at once the most difficult and uncertain, and, with ordinary remedies, generally results in failure. Hence the importance of employing an agent which will act as a protection to the pocket for at least twenty-four hours. It should be non-irritating and antiseptic, and be capable of being formed into a paste. This is found in the agent recommended,—quinine.

The investigations of Professor Binz, announced in 1867, demonstrated the fact that quinine, combined with human blood, at once arrests the diapedesis of the white blood-corpuscles. This has been "confirmed by other observers,—Scharrenbroich, Kerner, and Jerusalimsky." Binz also found that, when the mesentery of the living frog was placed under the microscope, quinine having been previously given, there was no aggregation of the white blood-cells in the vessels, nor did emigration occur upon irritation. "Dr. H. A. Hare (Professor H. C. Wood's 'Therapeutics') found that the vessels in the cinchonized frog were much more contracted and had the walls much thicker than in a corresponding frog without quinine. This contraction of the vessels is thought by Dr. Hare to be the result of a direct action exerted by the drug upon the muscular coat of the arterioles."

The somewhat remarkable dual character of quinine—a proto-

plasmic poison and antiseptic—made its use as a topical application a natural sequence. It was applied by myself some years ago as an experiment upon a fungoid presentation, so common between teeth with cavities on their proximal surfaces. Freely scarifying the parts to permit absorption of the agent, it was found that rapid resorption of the hypertrophied gum took place. This was further tested on the various forms of gingivitis with equally favorable results. It was then used in pyorrhœa alveolaris in the form of paste,—sulphate of quinine and water,—and with such satisfaction that it has become a standard therapeutic agent with myself in this disease.

The continued use subsequently of an antiseptic, in the form of a daily wash, is perhaps the most important of all, for, whatever treatment be used, if the patient fail to continue this, there will be a return of all the original symptoms. This will be understood when it is considered that the pocket rarely closes entirely, and any depression remaining invites to collection of the fluid contents of the mouth and subsequent fermentation.

The use of hydronaphthol is not only of great value in this lesion of the pericementum, but is also in all forms of gingivitis, and should be recommended for daily use in keeping rubber-plates free from irritating accretions. Where this or similar powerful antiseptics are used, of a non toxic character, the inflammation of the mucous membrane, so commonly connected with the wearing of these plates, will, in most cases, be prevented. The plate should be kept at night in the solution, weakened by water. Thymol and creolin may be substituted for this; but, in the experience of the writer, this agent has proved effectual in all forms of oral inflammation, and in the amount named is non-irritating and free from any injurious effects.

CHARACTER AS DEMANDED IN PROFESSIONAL LIFE.¹

BY FORREST G. EDDY, D.M.D., PROVIDENCE, R. I.

It used to be the practice, and perhaps continues to be, in New England churches, for ministers, when the occasion required, or when matters had for some time been running perhaps too smoothly

¹ Read at the annual meeting of the Harvard Odontological Society, Boston, February 25, 1898.

in the ecclesiastical grooves, to deliver what was known as a "doctrinal sermon,"—one of those terrible appeals which were calculated to arouse the imaginations and the consciences of the most hardened listeners. It was a sort of old-fashioned way of "rounding up" the flock, and of branding anew the straying members with a renewed sense of their obligations and their shortcomings.

Animated with a somewhat similar zeal for our mutual welfare, I shall venture this evening to address you briefly upon a matter which deeply concerns us all as professional brethren, and yet which in the hurry of our practical life is easily lost sight of, however important we inwardly admit it to be. Do not be alarmed at the prosiness of the text if I confess to you, without further preface, that the subject of "Character in Professional Life" has seemed to me of sufficiently vital interest to us all as men and as dentists to give me the courage to ask your attention to a passing consideration of its demands upon our lives. I shall most assuredly seek to leave wholly out of the question the morally painful axiom, that character in every department of life and action is a good investment,—that, in fact, it pays. We all know this to be true beyond peradventure; no one is enough of a cynic to attempt to gainsay it; and recognizing this fact, we shall do well never to forget it, and yet never to be sordid enough to urge worldly success as a prime motive for the upbuilding of a strong, persistent, and ever-developing human character. I would appeal to you on far higher grounds to consider with me the essential needs, in our chosen path, of a lofty ideal of manhood, so exalted that it shall put us above even the possibility of pursuing the true course with any other purpose than the supreme satisfaction of having *kept the faith for its own sake*, regardless of personal gain or loss by the way. Sertorius said, "The man who has any dignity of character should conquer with honor, and not use any base means, even to save his life."

I do not propose to give voice to pessimistic comments over the examples—sadly numerous of late years—of men who in many pursuits have set forth apparently with noble intent, who have advanced, seemingly with rectitude and correct standards, and then suddenly have been tempted, have wavered, and then have gone down from high places to the merciful darkness of oblivion,—pitiable failures. It is a commonplace story. You may read it in every daily paper. It hardly excites comment, and an occasional shrug, as we mutter in bitterness and pity, "Another good man gone."

The dangers of a professional life are, fortunately, not so great as those which beset men concerned with vast commercial ventures

of the day, where enormous stakes are played for yet more enormous and unjust gains; but the danger differs not in kind, but in degree. Mankind, weak, irresolute, roused only at rare intervals to a quickened sense of the responsibilities of the moral life, has nevertheless a sure, instinctive appreciation for what is better than itself. This has lately been seen in the death recently of a "good, great man" in this city, one who did noble work in behalf of Harvard Dental School, whose one unceasing message to his fellow-men was to impel them to live up to the highest ideals. It will never be adequate to the formation of real character to coax ourselves that we are doing fairly well because debts are paid and a conventional rectitude maintained. Not to personal charm or wealth of intellect will men pay the homage alone due to a majestic character. Any attitude seems preferable, morally, to that sublime conceit which recognizes no necessity nor possibility of advance. This unhappy condition is well reflected in that prayer uttered some years ago by a preacher well known hereabouts, who petitioned his Creator somewhat as follows: "O Lord, now grant us that self-complacency which is the balm of life."

There is little need for me to speak with special significance upon the necessity for medical men of all specialties to keep themselves above the least taint of professional suspicion. Dr. Oliver Wendell Holmes has again and again dwelt, as he so well knows how to dwell, upon the large, generous, yet exacting ethics of the code, which is as binding upon our department of the profession as upon any.

The more obvious side to this question of character, as it concerns us, is the careful avoidance by the slightest word or act of anything which shall call down reproach upon our calling or upon us as men. I do not mean to inculcate, of course, any weak subservience to the dictates of what is called, by convenience, "society,"—that intangible yet forcible consensus of organized humanity which undertakes to say how we shall speak, eat, dress, and behave when in open relations with our fellow-beings. Any timorous sacrifice of personal freedom of action, so long as we know ourselves to be right, is no gain in character. Etiquette—a cultivated and well-sustained courtesy of manners—is, however, by no means despicable. More often than not it is the evidence and the earnest of higher purposes within. Manners are not of necessity morals, but they are the choice fruits of a sound growth. It is certain that those who are of hypocritical purposes will soonest adopt that which they hope will pass for sincerity, by simulating a

smooth and winning external conduct, which is in them more repulsive because the genuine thing is so desirable. "Be and continue poor," said Heinzelmänn, "while others around you grow rich by fraud and disloyalty; be without place or power, while others beg their way upward; bear the pain of disappointed hopes, while others gain the accomplishment of theirs by flattery; forego the gracious pressure of the hand for which others cringe and crawl. Wrap yourselves in your own virtue, and seek a friend and your daily bread. If you have in your cause grown gray *without unbleached honor*, bless God and die."

With the gradual advancement of softening influences of civilized life many things once admired have had to make way for others still better. One cherished delusion in particular, I fear, will now have to be given up as superannuated. I refer to the man once esteemed among us, with a "kind heart and rough exterior." We are none of us so young that we do not recall the old-fashioned dentist of infancy, of bluff, cheery ways, whose person and office smelled largely of his stable as well as of his pungent drugs. With all the heartiness and moral soundness of these good men, there is now recognized to have been not a little selfishness in their inconsiderate absence of cleanliness and outward deference to others. Their bluntness often was, to the careful observer of human character, a thin cloak for their abnormal sense of their superior knowledge. They lacked, good fellows as they really were, the consequent modesty of the highest wisdom.

Another thing which has already entered largely into our professional life, and which is certain to become a still more prominent influence, is the rapid change of the relations between men and women of the present day. I have not felt it necessary before, gentlemen (as we all surely are here), to dwell upon the imperative call for every one to be solicitous of reputation and to give no occasion for idle speech; nay, rather of that busy speech so ready to undermine the established foundations of a good name, in the foul hope of pulling down the whole structure over its owner's head. It may be difficult to live up to the demands of the highest ethics, but we can at least obey the decalogue. It is not of the grosser forms of misconduct of which there is need to speak, but to call attention simply to the new demands of the age. The now generally observed practice of employment of women assistants in the operating-room of the profession of dentistry we must hold not so much to protect our patients as ourselves. Whenever women co-operate with men in daily life, manners are gentler, courtesy becomes an

exchange of mutual consideration, and not a patronizing deference of the stronger to the weaker. The doctor who secures immunity from the too frequent incursions of the sentimental, the hyperæsthetic, or the hysterical patient of the other sex is recognized as a self-respecting man and one who saves time for his practice which he might otherwise, through misunderstandings or malevolence, be forced to devote to explanations, or even as a defendant in a lawsuit. Women—the best sort of women—now wish to be recognized not as women, but as human beings, and there never was a time when frankness, ingenuousness, and honesty of purpose were so well understood. The age of silliness is happily passing in this respect. Dignity, inflexible courtesy to all conditions of age, sex, and of worldly circumstances, are now met with openness and an intelligent appreciation of the motives which underlie outward conduct. Women are quick to see and to approve the spirit of fairness, especially if it be free from all irritating condescension; but before the ideal condition between patient and dentist can be realized, the latter must have definitely shown himself “from spur to plume a stainless knight,” no matter what may be the character, the attitude, or the behavior of those whom he may meet in daily practice. He, at least, must be without fear and without reproach.

Do not for a moment suppose that I am advocating a merely professional manner. Nothing can be more distasteful to those of a delicate perception in morals than that priggish decorum in which the man is wholly merged in the doctor. One must be of poor stuff who does not dare to be himself in any circumstance of life. “Who is that man over there?” asked one man of another. “His name is Higgenbottom, and he looks it.” It will not do to *look* professional merely. A man is of some consequence in the world when it is known he can be relied upon; that when he says he will do a thing, he *can* do, and *does* it.

I see one distinct advantage in the possession of a lofty character for those of our avocation, of which it is not easy to speak without exciting, perhaps, derision, and yet, certainly in giving utterance to my thought, I have no wish to provoke even a smile. Doctors, and especially dentists, are frequently made the subjects of many pointless jests as relating to matters financial. Like the lawyer, the doctor and the dentist are often made to feel that the public are fond of regarding themselves as the victims of inconsiderate charges. This is not a pleasant condition to find existing, and yet it undoubtedly does exist, whether as a phase of “American humor” or as a firmly-established theory in the popular mind.

It seems to me that nothing sooner tends to disarm prejudice of this sort than the awakening conviction of those who resort to us, that a professional man who is honorable in most things is apt to be so in all, and that if he respects himself and his character before men, he will of necessity respect the nature, and hence the value, of his professional services. Perhaps this is a trivial matter in your opinion, but at least it is not so to those who approach us for aid. Extortionists and tricksters are responsible for this false estimation in which we are sometimes held, and therefore the more solicitous we are of honor as professional men the more rapidly will the cure operate.

It is said that no member of the callings of medicine and dentistry has ever been elevated to the peerage of England. Many have been knighted, many more have been held in love and veneration, but no one of either profession has ever been offered that prize secretly coveted by every loyal Englishman. The cause is said to lie (though I do not personally know it to be the case) in the deep-rooted prejudice which holds that any one constantly employed in daily contact with the frailties and diseases of humanity is in some sort influenced for the worse by a degrading contamination; in other words, the alleviation of bodily ills, while it may render a man worthy of respect and of a limited recognition, makes it impossible at the same time that he shall be ennobled. It is curious, yet natural withal, with the rapid democratization of life in England, that this feeling is diminishing. Its professional men were never so esteemed, even without its cherished coronets, and, as a logical sequence, they never so much honored themselves or so dignified the callings of dentistry and medicine.

In this country no such unhappy and absurd stigma has ever attached to our position, nor have our opportunities been stifled by social obstructions. A rare courtesy, a dignified and self-centred control, a delicacy and chastity of soul which is probably a part of the national character, has distinguished our profession here and has given it repute abroad.

While we have much cause for self-congratulation, there will always be abundant cause for self-examination and improvement. Born of a race of idealizing tendencies, never to be satisfied with anything less than an absolutely high standard, it becomes us not merely to maintain what is won, but to persist in the arduous path we have so successfully trod. In addition to worldly reputation and to the certainty of personal gain, we must carefully insist upon, for ourselves and for our brethren, a loftiness of character which

in political and social life we Americans require in others. Scott's last injunction to his son-in-law was, "Lockhart, I may have but a minute to speak to you. My dear, be virtuous, be religious, be a good man. Nothing else will give you any comfort when you come to lie here."

You will pardon whatever of the commonplace I have uttered this evening. It is needful at times to be very plain. At least, what I have said has been born of conviction.

THE TREATMENT OF NEARLY EXPOSED PULPS.¹

BY DR. C. F. IVES, NEW YORK.

WHEN asking me to give a brief "communication" on the treatment of "nearly exposed pulps," the chairman of the Executive Committee said, "It is a long time since we have had a talk on 'pulps,' and it will do us all good to stir up a discussion." I have really nothing new to say, nothing original to offer: an experience or two, some confessions of failures which set me to thinking; and you all know that when we sit down to the task of honestly criticising our own failures some good results are apt to be evolved. I will simply tell you how I treat these cases. If it prove to be "ancient history," it will at least provoke discussion, and so we may gain a point.

By nearly exposed pulps I do not mean those cases where, if you lift the last layer of semi-soft decay, a living pulp presents itself, but those where a fair amount of sound dentine intervenes, and you are in dangerous proximity. If you recognize the situation, proceed to place some non-conducting substance on the floor of the cavity before introducing a metallic filling, and you will find, after one, two, or more years, a dead pulp, and you wonder why! If, on carefully removing the filling, no non-conductor is found, but sound bone, and the filling too near the pulp, its death was the result of thermal changes.

My first failure was a case of my own. A large approximal cavity in a superior central, no exposure, a capping of oxyphosphate preceded by two or three coats of varnish, then a filling of gold.

¹ Read before the New York Odontological Society, March 21, 1893.

Five years of quiet, then pain. A careful removal of gold and cement revealed no decay, only as the burr entered the chamber the layer of dentine was a little thinner than I had anticipated, but it was thoroughly protected. It was not the oxyphosphate, or thermal changes, but pressure.

That same year I had an exceptionally large number of cases not my own work. Being greatly interested, I was careful to remove the fillings, first placing on the dam. In many I found a fair layer of sound dentine over the dead pulp. In one—a large crown approximal cavity in a superior molar—the operator had more than half filled it with gutta-percha, over which was amalgam. It was very evident what had killed that pulp. In many others metallic fillings had been placed directly on the floors of the cavities.

I think that in comparatively painless excavations, with the feeling of sound bone under the burr or excavator, we are very apt to take chances perhaps not warranted, forgetting that one thing a pulp will not submit to is *pressure*, and we are often a trifle nearer the dividing line than we are aware of. Here is my point. You cannot place directly over a nearly exposed pulp as a non-conductor either gutta-percha in bulk or solution, oxyphosphate, oxide of zinc with carbolized gum-water, or any compound that will harden, without producing pressure from expansion or contraction. It may be slight, but, slight as it is, I know it often results in the death of the pulp. Gutta-percha, tissue-cork, quill, or whatever may be your favorite capping, if lying directly on the floor of the cavity and covered with other material which requires even light packing, will often prove fatal to the nearly exposed pulp.

I endeavor to avoid all pressure. A piece of very thin aluminum,—this because of its purity and lightness,—a bit of hard wood, apple-seed, or shot-head burnishers, and in a moment a concave cap is prepared to fit the case (this dipped in varnish); the cavity bathed with oil of cinnamon (not oil of cassia, which is the Chinese product, but the Ceylon oil, which you will know, because it will cost you two dollars an ounce), for which I have discarded all other antiseptics in cavities, because it is safe, effective, and pleasant. The cap, always large enough to rest outside the line of the chamber, is covered with a layer of "Fletcher's Nerve-Capping." If you do not use it, let me urge you to try it. For thirteen years it has proved in my hands an efficient aid in all such cases. It is an oxysulphate of zinc, non-escharotic, and hardens sufficiently in three or four minutes to pack any material upon. It is a beautiful temporary filling, wonderfully nice for cavity lining, and, in combination with

any good antiseptic, an excellent root-filling. I always cover my application of arsenical paste with this cap and Fletcher's material, avoiding all pressure. Dr. Miller, of Berlin, has recently spoken very enthusiastically of it.

Let me tell you of an excellent varnish. Procure a piece of clear amber, scrape or powder it, dissolve in Squibb's chloroform, which will take some time, add a little absolute alcohol to delay evaporation, and you have a varnish so hard that it will resist almost anything.

As this is a family talk, let me say a word or two about exposed pulps. I confess right here that, to the best of my knowledge, I never saved one in my life, and I have faithfully and honestly tried. I have nothing to say against your trying, for, to paraphrase some one else, "I need not compound for sins I am inclined to by damning those I have no mind to," but it is positively wicked for me to attempt this any more. If ever the time comes, however, when the operation is an assured success, one great factor will be absolute freedom from pressure. I have had some disagreeable cases to treat which I consider the result of destroying pulps by driving a splint of wood up as far as possible,—“pulp-condensing.” If any of you use this method, inform us, when your turn comes, why!

Now I have said just enough to start the subject, and from your various experiences we shall all have something to take home with us for edification.

Reports of Society Meetings.

NEW YORK ODONTOLOGICAL SOCIETY.

A REGULAR meeting of the New York Odontological Society was held on Tuesday evening, April 18, 1893, at the New York Academy of Medicine, No. 17 West Forty-third Street, New York City. Dr. Woodward presiding.

The minutes of the previous meeting were read and approved.

Dr. Bogue read reports on the death of Drs. Allport, of Chicago, and Levy, of Orange, N. J., which were adopted.

INCIDENTS OF OFFICE PRACTICE.

Dr. S. G. Perry.—In the April number of the INTERNATIONAL DENTAL JOURNAL, Dr. Davenport, of Paris, exhibited a number of

casts illustrating a method of drawing in the front teeth by the use of twisted wire. The work was well and successfully done, but I must say that I do not see the advantage over the plan in which one end of the wire is vulcanized into the rubber plate, and tightened by a screw which holds it at the other.

This plan, which I described years ago before this Society, and which Dr. Guilford illustrated in his book on orthodontia, is one in which the fixture is not perhaps quite so easily made as the one described by Dr. Davenport, but it is very smooth and free from projections, and is worn without chafing the delicate mucous surfaces of the lips, and it has the advantage of being easily tightened or loosened, and of being operated by the patient. It is a most comfortable method, and one which I have employed for many years with great satisfaction.

But during the last year or two I have adopted for these cases a method still more easy of construction and quite as easy of application and of management.

I cap the bicuspid, and sometimes the first molars, with a simple rubber plate, which is made with a little ridge rising over the bicuspid. Through this ridge a very small hole is drilled and countersunk on the distal side, and then the thinnest saw procurable is passed through the rubber into this hole. A knot is then tied at each end of a very thin piece of elastic—such as is used in place of wrapping-twine for boxes, parcels, paper, etc.—and the ends slipped through the cuts into the holes. The knots drop into the countersunk ends of the holes, and so are safe from the danger of chafing the overlying lips. The pressure is varied, of course, by tying the knots closer together or farther apart, as the case may be. When the plate is in place, the elastic is drawn over the front teeth, and if care is taken in drilling the holes in the ridge on the plate at just the right place, the elastic will not ride up against the gum or slip off from the front teeth. This device is the closest fitting and the most comfortably worn of any I have ever used. It is true that with this we do not get the rigid force of the screw, which Dr. Farrar has laid so much stress on, and the use of which he has called the “positive system,” or the rigidity of Dr. Davenport’s twisted wire, but we get the application of a force that is very steady and very free from the intermittent periods of soreness and pain, and, like the dropping of water which wears the stone, is one that is as positive in its final effects. The force of this band, which conforms to the shapes of the teeth, is felt more by those that are most prominent and need most to be moved, but the pressure is

distributed over so many teeth that none are made sore. In fact, my directions to the patients have been, "If the teeth get sore, tie the knots wider apart." This method is shown in Fig. 1. It happens to be taken from a cast which shows the work completed. The molars were not capped by the plate, but left free in order to secure a slight elongation of them. In quite a number of instances, where I did not want to interfere with the natural occlusion of the teeth, I have been able to run out on each side a little spur of the rubber plate, taking advantage of some space between the articulating bicuspid, or bicuspid and cuspid, and with the same effect. This plan has worked well in several instances where there has been only one or two prominent teeth to be drawn back.

It is a system that also works well near the finish, where every particle of space must be utilized. To be able to use a plate in this way without interfering with the occlusion makes this operation an easy one for the patient.

Here is a plate which was worn without disarticulating the teeth. It was made for a girl who was away at school, and it accomplished its purpose in a reasonable time, and without my seeing her but a very few times. The method of holding these little bands was suggested to me by the manner in which violin strings are attached to the tail-piece of the instrument.

I want to show here a device I have had made for holding a little mirror, which is to be used as a mouth-mirror, or for the purpose of reflecting light into an obscure cavity. It is shown in Fig. 2. It is attached to a pedestal which is to stand on the operating tray, and has a projecting arm about seventeen inches long. In height it is adjustable, and can be made to vary from five to nine inches.

It has also a hinge-joint, which makes it still more adjustable. Inside of the projecting rod or arm, which is hollow, runs a smaller rod, to which is attached a ratchet, which tightens or loosens the ball-and-socket joint at the other end. To this ball the mirror is attached. The movement of the glass is very free, and it can be placed at any angle and securely held there by clamping with the ratchet. By this device the cavity can be seen by looking into the mirror, or light can be reflected to any given point, and yet both hands can be free.

The liberation of the left hand is a great point gained. This gives the opportunity for the use of instruments for holding the dam above the cervical edge of cavities, and for the holding of matrices and rubber-dam depressors, and for holding in place the first pieces of gold in filling.

Dr. Remington.—Have you found a way to hold a child's head steady?

Dr. Perry.—No; but this device is not meant for children. It is designed more particularly for those extremely difficult operations that tax one's ingenuity to the utmost, and where one is glad of every little help.

Dr. Jarvie.—Do you not find the arm in the way?

Dr. Perry.—Certainly, sometimes, but it is the lesser of two evils. I am willing to have it in the way in order to accomplish what I can do with it.

I have here a great variety of instruments which have been shaped to use between the teeth, for holding the rubber dam above the cervical wall, and for partial matrices. They are of various shapes and widths, and adapted to all the teeth. Some of them are very wide, and of great service when held as matrices on the posterior side of the last teeth. I have also here a distinct set of right and left matrices made from very thin steel. On one end is soldered a little lug which is designed to hold the matrix close by resting against the adjoining tooth. To the other end is soldered the point of an old excavator, which serves as a handle, and which enables one to control the matrix. By means of this handle the matrix can be quickly applied, and by pulling on it the lug forces it close to the tooth on the inside, while on the outside it can be held close to the tooth or turned away to give better access to the cavity. For the placing of plastic fillings these hand matrices, as I think they should be called, are invaluable. Nothing I have devised in a long time has given me as much satisfaction as these have done. Of course, their use is made more available by means of the mirror-holder. They are shown rather poorly in Fig. 3.

In addition to these I want to show some instruments which have several uses, the principal one being that of depressors, for holding the rubber dam below the margins of the buccal and labial cavities. They are also designed for reflecting light into the cavities to be filled. Also for collecting the gold filings from the surfaces of the rubber dam. They are made by swaging disks of steel into the form of concave cups and soldering handles onto them, so that they are not unlike the ordinary mouth-mirrors. When highly polished and nickel-plated they are powerful reflectors of light, the focus, of course, depending on the concavity. They are of different sizes, the smallest being three-eighths and the largest one-half of an inch in diameter. They are made in three sizes; one of each size is used in the form described,—simply a round, rather

deeply concave disk, and so highly polished as to almost answer as a mirror. But others are filed out in scallops of different sizes and angles, and these scallops fit the teeth and the gums.

From this handful it is easy to select one with a scallop that will fit any tooth, however large or small, and the festoon of almost any gum. Here, then, are instruments with which the dam can be pushed back and held in such a manner as to disclose a cavity on any but an approximal surface. If the dam is not used then the gum can be pushed back in the same manner, and so efficient are they for this purpose that sometimes the dam need not be used at all. And while doing all this they reflect the light in such a manner that the cavity becomes luminous. Still another advantage arises from the fact that the concavity of the instrument gives the room which is needed for the instrument to work in. They are not intended to take the place of the beautiful instrument Dr. Woodward has perfected for holding the dam above the edges of buccal and labial cavities. They are only to supplement it when lack of time or the conditions preclude its use. The round ones, which are like little spoons, are useful for collecting and saving the gold filings that fall on the rubber dam.

Dr. Littig.—Where do you have these things made?

Dr. Perry.—They are made by Mr. F. Drumm, 505 Pearl Street, New York. He is not a dental instrument maker, but a fine mechanic, and competent to make anything you give him drawings or directions for.

I have here some other odds and ends which perhaps may be worthy of mention. Here is a pair of pliers designed for carrying sand-paper strips. The beaks are curved at the right angle and are made round and smooth, so that, in using them, the strips do not tear, as with ordinary pliers which have sharp edges. Here is another pair, made for holding very small sand-paper disks in order to use them as one would a file for finishing gold fillings near and under the margin of the gums. They are made flat, with one beak longer than the other, to support the disk and hold it to its work. On the other beak is soldered a little spur, which passes through the hole in the disk and keeps it from slipping. These disks, used in this way, do not cut rapidly, but they give a finer finish than I have been able to get with files. They slip up under the gum and do their work without cutting or tearing that tissue. Of course, they are only to be used in inaccessible places, where the same disk attached to a revolving mandrel cannot be applied. And, by the way, here are some corkscrew mandrels for holding these and

larger disks. They are similar to those I exhibited some time since before this Society, but they are refined and improved, and for those who have not seen them may be worth a moment's notice. With them, while revolving, the disk is picked up from the fingers instantly, and is held with sufficient firmness to do its work. The absence of a nut to adjust is a great saving of time, and also permits the use of these very small disks.

Here, also, are some corkscrew mandrels designed for holding the polishing disks or wheels, made by Dr. Frank Darby, of Elmira. They are not unlike those in use, but they are far more delicate, and they are very certain to hold the wheel.

Here is a small illuminating mouth-mirror, with a flange attached to its rim for holding the rubber dam below the edge of a cavity and out of the way on the posterior surface of the back teeth, and at the same time allowing the use of the mirror. The flange revolves around the edge of the mirror, and it can be adjusted for the right or left side of the mouth.

Two months ago there was some talk before this Society about the cleansing and filling of roots, and if it was not said outright, it was inferred that it is not always possible to actually get into the buccal roots of superior and the anterior roots of lower molars, so as to clean them carefully and to fill them accurately. We know that this is true; still, I believe they can be more thoroughly cleansed and more perfectly filled than they generally are.

Beyond the enlargement of the orifices of the roots, which I accomplish with the reamer I exhibited two or three years ago, I do not believe in reaming out the canals of roots, because many are curved and some are flat, and there is too much danger of going through the sides. The instruments I use for getting into these small canals, which are left in their natural condition, are the small broaches used by jewellers. I buy them in quantity, and draw the temper from them to suit myself. They are four-sided, and a few fibres of silk or cotton can be rolled or twisted onto them so firmly that they are not easily pulled off. (I use the raw silk because of its very long and tenacious fibre.) By twisting this instrument on which the silk has been rolled in the root the silk fibres become entangled in the pulp, and very often it can be removed whole.

I use these smooth instruments in this manner for the most part in preference to barbed ones because they rarely break, because they are efficient, and because they can be passed into a smaller canal than any instrument that has been barbed or bent into a hook at the end. Of course, to barb an instrument, or bend a hook

on it, is to increase its diameter so that it will not enter these small canals, and every cut made in barbing the instrument increases the danger of its breaking. If the instrument does not break, the barbs are liable to break off and be left in the canal. A very few fibres of silk, lightly wound, do not increase the diameter of the instrument very much, and they hold and convey the carbolic acid I use if the pulp is not quite dead, and if they do not take the whole of it out, they entangle and take out pieces of it. In this way, cauterizing as you go, the whole of these delicate pulps can be, by a little time and patience and very little pain, entirely removed. The silk, which at first comes away loaded with pieces of pulp and blood blackened by the carbolic acid, will after a time come out white and clean. It may then be very difficult, and perhaps impossible, to really fill such small canals with anything absolutely accurately; but if any of the mummifying fluids are used, carrying them to the apex with this instrument and the silk, I am not so very sure that it is necessary. Of course, I endeavor to fill them (and for this I use oxychloride, putting in the fluid alone at first, or chloro-percha, using the chloroform first, carrying them to the apex with the silk-wound instrument and then plunging into the canal a gold wire about the size of the broaches), but I am not always certain that the confined air does not act as a cushion and prevent making a perfect filling. I aim to be more certain of getting the pulp all out than to get the canal perfectly filled. Of course, I am talking of very small canals,—so small that the smallest broach we can get will only allow a very few fibres of the silk to be used; and we must remember that such small canals at the apex are almost hair-like, and if well mummified by fluids which can be pumped into them, I do not fear them even if they are not absolutely accurately filled.

Dr. Hodson.—In removing the pulp, what is your method of manipulation where you use the silk? I have used the same thing with a small piece of silk on the end. It winds itself on the broach alone without winding itself on the pulp.

Dr. Perry.—I let the fibres project from the end of the instrument, forming a little fluff, which is more likely to become entangled in the pulp when the broach is rotated. Of course, the silk or cotton cannot be twisted readily on a round instrument, but even only a half-dozen fibres of silk or cotton can be instantly and most readily twisted on a broach which has four sides and four edges, and so firmly, if you wish, that they are not easily removed.

A little practice will enable one to twist it on the instrument

tightly enough to use without slipping off in the canal, but yet so that it can be readily removed by pinching with the napkin between the thumb and finger. Where medicines are employed, I use a little piece of rubber dam over the napkin to protect the fingers from the odor. Of course, for the large bulbous pulps I sometimes use barbed instruments or hooks in the usual way. The use of these broaches and in this way is not new, but was known in the early days.

I take up your time in this way partly to call attention to this method, the advantages of which, I think, have been overlooked by many, but more particularly to explain the reason for exhibiting a most simple wood handle which I use for these broaches. It is about the length, and at its largest end not quite twice the diameter, of an ordinary parlor-match. One end is made very small for about a half-inch, so that in winding the silk on the broach it rotates rapidly between the thumb and finger. Into the other end a hole is drilled a shade larger than the handle of most of the broaches as we buy them. The broaches are fastened in the hole in the wood by simply winding a few fibres of silk or cotton about the handles, and pressing them home with the pliers. A dozen of these simple handles will last one a lifetime.

Why should a large handle be used for these delicate instruments? I once saw in Dr. McKellops's hands a barbed nerve instrument made of gold wire and mounted on a small handle like this, and the dealers sell nerve instruments mounted on small handles, but not tapered nor designed for rapid rotation between the thumb and finger, which is the peculiar feature of this handle.

I have here a very ingenious instrument which can be attached to any engine, and which is designed for holding a flexible file or a strip of emery cloth or of sand-paper for finishing fillings on the proximate surfaces of any of the teeth. It can be also used, to a certain extent, for trimming the roots of teeth preparatory to crowning. It is the invention of Dr. W. F. Giddings, of Seattle, who sent it to me last fall to be exhibited, if I thought best, before this Society.

I have not shown it before because it has not happened so that I could have an engine here to show it to advantage. It is a remarkably ingenious device, and yet it is very simple in its action. Like many inventions, when once seen the wonder is that it had not been thought of before. From the end of a cylinder project two rods a little more than the width of a molar tooth apart, bent at the ends at right angles, and containing slits into which a flexible

file or sand-paper strip can be placed. A revolving cam in the cylinder drives these rods back and forth like pistons, and with the effect of drawing the sand-paper strips back and forth very rapidly when wrapped partly around a tooth. Of necessity the strips in operation are wrapped around the teeth in such a manner that the contour is preserved the same as if used by hand. It operates smoothly, and rapidly, of course, if the engine is used at great speed.

Dr. Giddings also sent with it a dental mallet, in which the socket that holds the plugger-point is worked back and forth by a cam on the same principle. I have not been able to test this, as the attachment is such that I cannot apply it to my engine.

Dr. Perry.—I would like to introduce Dr. Lowenthal, of Hoboken, who has something to say to you.

Dr. Lowenthal.—My idea of a cylindrical sand-paper disk, to be used in connection with the adjustment of gold crowns, presented itself to me a few weeks ago. After having constructed a number of these disks and making different sizes thereof, I at once applied them to a case which presented, and the result achieved was indeed very gratifying to me.

It was after this experience that I submitted the idea to my friend Dr. Perry, and his favorable criticism of it and subsequent invitation to the meeting of the Odontological Society gives me the pleasure of appearing before you this evening.

The disk I use this evening is made of coarse sand-paper, and closed in on one side by a soft piece of wood, into which the screw mandrel can best fasten itself. I generally use the right angle attachment or hand-piece, as this enables me to bring the disk directly over the tooth to be worked upon. Before using the disk the sides of the tooth to be fitted are ground down with the emery wheel, and after that the final preparation may be accomplished with the disks, which gives the tooth a round and polished surface; the last-used disk serves as a measure, inasmuch that the lower edge of the disk is cut off and the strip laid on the metal from which the crown is to be made. These disks could be numbered and made to correspond with gold crowns, to be bought at the dental depot.

I would suggest that the disks be made of other material than paper, since the moisture in the mouth is too readily absorbed by it, thus swelling the same. Celluloid will be the material best suited to the purpose. The disk has a very close adaptation to the tooth in preparation, and through this it is that the gum suffers but very little. Although it is necessary to work beneath the margin of the

gum, the motion is uniform, and therefore the patient is but very little distressed.

It would have given me pleasure to bring the lady before you for whom I set the first crown, in order that you might see and become convinced of the nicety of this manner of preparation, but I regret not having been in a position to do so; nevertheless, I hope that the specimen which I take pleasure in showing will convey the principle to you. It required but ten minutes to prepare the root and make the band.

Dr. Ives then read the paper of the evening, entitled "The Treatment of Nearly Exposed Pulp." (For Dr. Ives's paper, see page 499.)

Dr. Francis read a short discussion which he had prepared, and added the following remarks:

DISCUSSION.

Dr. C. E. Francis.—Some thirty years ago the subject of capping exposed dental pulps was freely discussed at our Society gatherings, and much was said concerning the advisability of treating them with a hope of preserving their vitality. Gentlemen of acknowledged skill and professional ability freely participated in these discussions, but differed widely in views, both in regard to results of repeated experiments and the practicability of ever attempting such operations. Numerous articles were also published in the dental journals, some advocating and others condemning, each with equal earnestness, efforts to treat and restore to a healthy condition pulps actually exposed and in various stages of irritation or inflammation.

Planting their theory on the basis that "a tooth possessing a living pulp is far preferable to a pulpless tooth," they would put forth their best efforts to keep alive this delicate organ, that its function might be continued to convey nourishment to the dentinal fibrillæ. Indeed, so impressed were these gentlemen with the importance of keeping alive the vital spark, as to recommend, in cases of partial dissolution, the operation of "amputating" or detaching the dead from the living portion of the pulp, and by subsequent treatment render the latter so perfectly healthy that in due time it would secrete a sufficient deposit of calcareous matter to afford itself protection from external influences.

Various methods were suggested for the treatment of such cases. Numerous instances were cited where successful results were secured, and very great enthusiasm was manifested by the fortunate

conservators of fragmentary pulp-life. Indeed, such numbers of cases were reported where exposed pulps were successfully treated, that an outsider, if present, might naturally have inferred that the operation of exposing and treating pulps constituted a large part of the dentist's practice. On the other hand were gentlemen of less sanguine temperament, who had no faith in treating for restoration pulps once exposed; giving as a reason that if once fairly exposed, whatever the circumstances or conditions, such pulps will, sooner or later, despite all care or treatment, yield up their current of vital power, and if suffered to remain undisturbed, will eventually occasion pericemental inflammation and perhaps alveolar abscess.

The discussion of the subject in question has been continued even to the present time, and no general conclusion has as yet been reached. Every dentist, however, has his own opinions concerning it, and each may have reached his individual conclusion.

Viewing this matter from my own stand-point, I would reiterate the old and oft-repeated statement which I have already quoted, that teeth with living and healthy pulps are far preferable to pulpless ones. If by an unlucky turn of an excavator a perfectly-healthy pulp is wounded, I believe that there are fair chances for its salvation if carefully and *quickly* treated. Some slight antiseptic application and a capping to prevent irritation from pressure or from thermal influences have proved successful in many instances, as subsequent examinations have demonstrated.

In the October number of the *Dental Cosmos*, 1869, in a contribution sent to that journal on the subject we are now discussing, I suggested bathing the cavity in a tooth wherein was a freshly-exposed pulp with creosote (which was much used in those days) and covering the pulp with a small cap of note-paper, then filling with oxychloride of zinc, which was the only plastic stopping of that nature then in the market. But the oxychloride of zinc has a tendency to cause irritation.

In the February number of the *Dental Cosmos* I contributed another article on the subject, in which I recommended bathing a wounded pulp with tincture of calendula, and, if painful, with carbolic acid also; then adjusting a paper cap with the inner surface covered with a thick solution of balsam of fir and chloroform. The chloroform quickly evaporates, leaving a coating of soothing balsam which perfectly protects the pulp from air or moisture, as well as from the irritating effect of the zinc acid, and holds the paper in the desired position. This can be covered by a plastic zinc stopping, and if all proves well, may be filled with a more durable material.

If considered necessary for better protection, one or more paper caps may be added to the first. The paper for pulp-capping suggested itself to me as being of the right thickness to be manageable, and the best substance of the same bulk for protection against thermal shocks that could be used.

It seems to me advisable, as a rule, to make the effort to preserve perfectly-healthy pulps when freshly exposed, even though successful but once in three cases; but I have no confidence in attempts to save pulps that are in any degree congested.

In deep cavities where pulps are healthy, but nearly exposed, after thoroughly excavating, washing, and sterilizing with antiseptics and warm air, I give them a good coating of white resin dissolved in chloroform, then evaporate the latter with warm air and partly fill with oxyphosphate of zinc. A cap of paper or metallic cap, as suggested by Dr. Ives, may also be used where conditions seem to require it.

I think it very unwise for any one to say that exposed pulps have never been saved. I have seen many cases where they have been treated and well preserved. I have in several instances had occasion to remove fillings afterwards, and noticed deposits of secondary dentine. I deem it necessary, however, to treat them immediately,—give them antiseptic treatment, and cap them as soon as possible. If a pulp remains exposed any length of time, I think it is a hopeless case.

Dr. Brockway.—I have capped many exposed pulps and saved them alive,—some of them for two, three, or four years, but not many for much longer.

It is possible that a freshly-exposed pulp, in a favorable condition, can be saved for an indefinite time, but such cases are extremely rare, and the percentage of success has proved so small as in my judgment to seldom justify the attempt to do so.

If a pulp has been inflamed in any degree, I hold that it is still more unwise to undertake to save it in view of the added uncertainty. I know that great stress has been laid on the importance of the living pulp to the tooth, and I will not undertake to wholly deny it; but we must bear in mind that its importance constantly diminishes with the maturity of that organ,—that is to say, a tooth in the mouth of an adult will do without the pulp better than one in the mouth of a young person.

Moreover, the operation of removing the pulp nowadays is of such a simple character compared with what it was formerly, and the advanced methods of treatment are so nearly certain, that there

would seem to be no excuse for not performing it if there is the least doubt as to the success of attempting to save it alive. If I were addressing a class of young dental students, I should advise them very strongly against spending as much time as I have myself done in undertaking to save exposed or even partly exposed pulps under all circumstances.

Dr. Hodson.—I think it would be interesting if Dr. Brockway gave us his method of removing pulps.

Dr. Brockway.—If I find a pulp exposed and still living, and so situated that it can be readily reached, I sometimes remove it alive by the application of carbolic acid or some other obtunder for a few minutes, and the use of a very delicate barbed broach. I have taken them out in hundreds of cases without the patient being aware that anything extraordinary was going on. Of course, there is a sharp but momentary twinge as the pulp is parted at the apex, but the patient is consoled by the assurance that there will be no further pain in the operation.

In cases where the nerve is not so accessible and the conditions not so favorable, I make an application of nerve-paste to devitalize it before attempting its removal.

Speaking of devitalizing pulps, I hear of patients having suffered untold agonies from the operation. I hold that this is unnecessary. I seldom have a patient complain of more than a slight uneasiness, lasting for perhaps an hour or so at most.

After removing such of the carious contents of the cavity as I can without giving pain, so as to more fully expose the pulp, I apply the arsenical paste upon a small bit of cotton moistened with carbolic acid, laying it gently upon the point of exposure, placing upon this a larger pellet of cotton sufficient to loosely fill the cavity. Upon this is dropped melted wax or paraffin to retain it in place without pressure and at the same time keep out the fluids of the mouth. The patient is then dismissed for a few hours or days, as the case may be.

At the next visit the pulp will probably be found so nearly insensible that its removal can be effected with little or no pain by the use of carbolic acid and a properly-barbed broach.

Where the pulp is found dead at the first presentation of the case, after opening into the pulp-chamber, so as to get free access to the root-canal, I place therein a drop of carbolic acid, through which must pass whatever instrument is used in cleaning it out; this prevents infection from the germs present in the air, seemingly the most probable cause of peridental irritation. This cleaning out

is done with suitable instruments, relying largely upon the Morey and Gates-Glidden drills, the effective use of which is greatly promoted by having my assistant constantly wash them by a jet from a syringe with water as hot as can be borne. Hot water I regard as an excellent disinfectant. Supplementary to carbolic acid and hot water I occasionally make use of other disinfectants, like bichloride of mercury, pyrozone, etc., where the conditions seem to require it.

Having the canal thoroughly cleaned and disinfected, I usually proceed to fill it at once, and this I now do in all cases where it is possible, by driving into it a piece of orange-wood, whittled to fit, first wetting it with carbolic acid or oil of cinnamon and smearing it with the iodol root-dressing, with which you are all familiar; this is then cut off, completing the operation.

For the method I have thus briefly described I do not, of course, claim the least originality,—much of it is due to Dr. C. M. Richmond,—but I do claim that it is the most simple and at the same time the most successful I have ever tried, and that by it, in my practice, the results obtained have been most satisfactory.

Dr. Francis.—Don't you sometimes find the pulp-canals so small and difficult of access that it is almost impossible to get any instrument to penetrate to the apex?

Dr. Brockway.—Very often; but I take this ground: any root that is so small as to be impossible of entering does not contain a sufficient amount of material to be feared. Those cases that cannot be reached and cleaned out with the delicate instruments we have now can be treated by the mummifying process, with the probability that they will give no future trouble.

Dr. Jarvie.—This is an old subject and the treatment of it an old story. I treat now such cases as have been presented in the paper pretty nearly as I have done for a number of years past. In my early attempts to save alive exposed pulps, I met with such unfavorable results that I did not persevere in the treatment very long. I came to the conclusion that where there was a probability of the pulp dying under treatment,—and the first intimation of the death of the pulp would be by periostitis or by an abscess,—it was infinitely better to extirpate the pulp in such cases and fill the root, when there was not one chance in fifty that we would have trouble afterwards. It never seemed to me wise to attempt to save pulps alive after they had been exposed for any length of time, or if they had given pain from inflammation or congestion. I can hardly agree with the essayist in his judgment of the cause of the

death of pulps, where there is, as he said, a slight amount of dentine between the cavity and the pulp. I cannot understand how any expansion or contraction of a plastic filling could cause pressure upon the pulp sufficient to affect it one way or the other. I think that where pulps die under treatment such as he has suggested, where oxyphosphate or oxychloride fillings are used, it is the escharotic nature of the filling which, being persistently kept in contact with the pulp, has caused its death. I do not think that sound dentine would yield sufficiently under the slight pressure that there might be to cause any impression whatsoever on the pulp. My treatment of cases where the pulp is nearly exposed, and where the layer of dentine is quite thin, is this: I first antiseptize the cavity with carbolic acid, and then with an air syringe evaporate it, and then I place where I think the dentine is thinnest, asbestos cloth so as to completely cover the nearly-exposed pulp. I have followed this treatment for a few years, and with satisfactory results. I do not remember now of the death of the pulp under such circumstances. I am speaking of cases where the pulp is not exposed, as the essayist mentioned in his paper. I do not refer to those where, if you should remove the next layer of decayed dentine, you would expose the pulp; I mean where there is a very thin layer of partially-sound dentine, not softened; disintegrated to a certain extent, yet not decayed. The asbestos cloth, which is the best non-conductor I know of, accommodates itself exactly to the shape of the cavity, and I think it is very valuable for this purpose. I would like to know what Dr. Ives means when he says there is either expansion or contraction in these plastic fillings. Is it that he is not sure which it is, or that there is expansion in one class and contraction in another?

Dr. Ives.—Did Dr. Jarvie ever have expansion without contraction?

Dr. Jarvie.—Yes; the normal size of the filling, say, is zero; the application of cold may contract it; to bring it back to zero it must expand. I would not call that expansion, because there is no pressure thus caused, and the expanded condition occupies exactly the space that it did in its normal condition.

Dr. Ives.—Take a plug of amalgam which is longer than it is wide. Amalgam has a tendency, as they say, to ball or assume a spherical form. To assume that form it must contract in some way. It cannot get into that form without contracting.

Dr. Jarvie.—I call that change of form. It is not necessarily contraction or expansion.

Dr. Perry.—One factor has not been touched upon yet: some of the most marvellous results in modern surgery are due to antiseptic treatment. I do not believe in putting anything over exposed pulps too rapidly, or seal them up without careful antiseptic treatment, following the plan that is used by the surgeons to-day when they cut into any part of the body. To cut into a rapidly-decaying tooth and promptly seal it over without any preliminary treatment seems to me to be unwise. In describing this, I would not undertake to do for a youngster what I would do for an adult; I should attempt to save a pulp for a young person, when I would not for an adult.

The question of pressure is of some moment when gutta-percha is used, for that will expand. You could not expect anything but trouble with it, because it has no antiseptic action whatever. But I cannot quite agree with Dr. Ives in the matter of pressure being such a great factor; the decayed part of the tooth is literally alive with germs, and to seal in such a condition without preliminary treatment, or without any at all, seems to me folly in the extreme. In the treatment of actually exposed pulps, in some cases I should try again if I had failed once. I have succeeded sometimes after making the third trial. I am not rabid, however, on the subject of capping exposed pulps, but I should not feel that I was doing justice to my patient if I did not attempt to save them in some cases. Some of them that I have treated are over twenty years old, for I keep records as Dr. Bogue does,—not, perhaps, as carefully as his are kept. I can pick out many teeth that had exposed pulps that respond quickly to the thermal changes to-day.

To be so radical as to kill all pulps, or to try to save all, seems to be most unwise. Give the tooth careful treatment so the germ-action shall be stopped, allow a little time for the recovery, and then apply the capping, but never fill permanently at once.

Dr. Ives's method of using a little saucer-shaped metal for avoiding pressure, I think, is very good. I follow the same plan. I take a small piece of platinum, lay it on soft wood, press hard on it with a round burnisher, and then with my scissors cut it out; then I have a saucer-shaped piece of metal. This I fill with carbolic acid and oil of cloves mixed into a paste with the white oxide of zinc; that is laid nicely over the exposed pulp, the metal being thick enough to prevent pressure of any kind; then the oxyphosphate is applied, and then the final filling.

Dr. Bogue.—I am very much obliged to Dr. Perry for bringing us to the matter of principles. The desirability of preserving pulps

alive I suppose can hardly be questioned. I was on the point of speaking of a case which occurred last week, where repeated fillings of oxyphosphate left the pulp in such a condition that there was secondary dentine deposited for nearly a quarter of an inch above the margin of the gum, so I actually cut the crown off and drilled in almost a quarter of an inch for the purpose of setting a pivot tooth before I reached the living pulp. Before we can decide that we shall try to preserve a pulp alive by capping, we should first decide whether it is in a state of inflammation. If it is, I should certainly say that the chances are against us; if it is not, and is merely in a state of irritation, I agree with Dr. Perry that I, too, have had some successes. If, on the other hand, it is but a recent exposure, I have every confidence that that tooth can be capped and kept in perfect health, because I will not have inflammation. Dr. Perry spoke of Lister's method, or antiseptic surgery. The best antiseptic is simply cleanliness; nothing more, nothing less. The use of carbolic acid or other antiseptics equals the absence of deleterious substances. If we can get our pulp into such a condition that nothing can irritate it, and leave it so, it will recover. In this connection it is perhaps not improper to refer to Dr. Hulihen's method. He drilled into the living pulp above the margin of the gum of an aching tooth; then he claimed that he could put a filling into the cavity even if the pulp was nearly or quite exposed. Why? Because when that pulp became inflamed, there was an opportunity for the contents of the pulp-chamber to exude. Strangulation did not necessarily take place, as it would in all cases where a pulp is covered over hermetically and inflammation takes place. Then, of course, strangulation, disintegration, etc., occur. It seems to me that our first question should be, Is the pulp in such a condition that it may be treated with fair prospect of recovery from its irritation? If so, we may attempt to save it; if not, I believe in destruction.

I want to say something here, lest I should forget it. A gentleman who was in Madrid for a number of years—Dr. Thomas—devised a plan for destroying pulps that seems so admirable that I want to tell it to you. He puts his arsenic, morphine, and cinnamon together, and having chopped up finely a quantity of cotton, mixes the medicament with it, and fills a bottle with the combination. It is ready for use whenever required, and is very comforting and quieting if the pulp is in a state of irritation. This preparation will not ooze out on the gum. I have been using it for five or six years, and there are several gentlemen in the room who can testify to its advantages.

Dr. Ives.—Dr. Perry speaks of cases of pulps which he has saved alive for twenty years. That was before Lister's method was known. You saved them without any antiseptic?

Dr. Perry.—We had creosote then, didn't we? And what is the difference? None at all, for this purpose. What surgeon is there who would undertake to heal a sluggish wound at once? He would take care of it first. Now, why should we seal up a pulp in a cavity instead of keeping it open for a time and dressing it and caring for it until the inflammation has subsided? If it does not succeed, open it, ventilate it, and try again, and you will sometimes be surprised at the result. One of the great surgeons uses only tap-water without any antiseptic, because he believes he gets absolute cleanliness just as well with it.

Dr. Ives.—Do not surgeons make clean cuts and bring the edges together at once?

Dr. Perry.—Yes, of course; and if we lay a pulp open, we can heal it at once, if we use the right treatment. We can be reasonably sure of success in those cases; but a pulp that has been exposed for a long time is almost hopeless.

Dr. Howe.—A distinguished English surgeon, whose name escapes me at this moment, has boasted that he discarded Lister and his system, and he is the most successful operator, perhaps, in abdominal surgery that there is in England. He says that he has no Listerism in his system. He uses tap-water which is not clean; he boasts of it because it is not clean.

Dr. Perry.—I have treated them as synonymous terms. I do not know what Listerism means if it is not absolute cleanliness.

Dr. Howe.—Tap-water is not perfectly clean, either in New York or in London.

Dr. Perry.—No; but it is running water, and that brings cleanliness.

Dr. Jarvie.—The one system is to obtain cleanliness and do away with the germs by absolute cleanliness, and the other system is to destroy the germs that are already present by chemical means. That is the difference between the two systems. The advantage that is claimed by those who use only the warm water is that all antiseptics have a more or less escharotic nature, which prevents rapid healing. That is the difference between the two systems that are both seeking the same end,—a thorough antiseptic condition.

Dr. Perry.—I do not know what difference there is between a piece of court-plaster and a little scarring of the surface with carbolic acid; it allows the healing process to go on underneath.

Dr. Ives.—I want to make a contribution to the library of this Society. It is an essay on "The Structure, Formation, and Management of the Teeth," by Fuller, of London, and is very rare.

The Society received the same with thanks.

Adjourned.

JOHN I. HART, D.D.S.,
Editor New York Odontological Society.

AMERICAN ACADEMY OF DENTAL SCIENCE.

THE regular monthly meeting of the American Academy of Dental Science was held in the Boston Medical Library Association rooms, February 1, 1893, at 7.30 P.M. President Brackett in the chair.

President Brackett.—The subject of our meeting is "Crown- and Bridge-Work," and Dr. Moffatt will open the discussion.

DISCUSSION.

Dr. Moffatt.—It is not my purpose to present an elaborate treatise upon the subject of crown- and bridge-work.

The "American System of Dentistry" devotes nearly two hundred pages to this subject, presenting such a variety of methods that we find ourselves in a labyrinthian maze, and feel as if we were looking at a railroad map of the United States, with all the stations in capital letters.

Professor Litch commences his article by saying that for the systematic study of constructive details in tooth-crown and bridge-work, the model of an upper palatine arch, with two strongly-planted cuspid roots and two twelfth-year molar teeth or roots, may be taken as "a typical case." That may do for a study, but, in my opinion, it is far from being a typical case. It reminds me of the cut that was so profusely circulated in the New York daily papers some years ago. The public were invited to bring their mouths, with four such snags in them, and have a piece of permanent bridge-work inserted that would last forever.

Now, such ready-made cases may present themselves, and those who advertise in such a general way may be able to collect numerous cases of that type. But, in my experience, such typical cases are very rare in general practice. Each case that presents itself is

sui generis, and must be studied by itself, and talent and skill exercised in its treatment.

No doubt Dr. Richmond has had as much experience as any or all of us, and it is very interesting and instructive to see him work in his own peculiar way. He has a great many little ideas that cannot be readily explained, and can only be understood by seeing him work. He has almost entirely abandoned the use of permanent bridge-work for large cases, using it only in small and limited areas, and, in my estimation, this is the best practice.

Bridge-work, as you all know, is not entirely the child of this generation. I was instructed in making bridges when I was a student, over thirty years ago. Bridge-work was done in those times; but, of course, modern methods have greatly improved the operation and extended its employment to a greater number of cases.

Dr. Smith.—At the request of the chairman of the Executive Committee I present models of a case of crown- and bridge-work. Many of you, I think, have seen the case before, but you have probably forgotten it, and it may be new to you now.

This is a case of crown- and bridge-work, and also, in connection with it, contour-work with cohesive gold. This model, marked "forty-two A," represents the case as it came to me. The result of loss of molars and their wearing down, and also the wearing down of palatal surfaces of the incisors and cuspids, is evident. One cuspid was a pulpless tooth; the other was alive. The pulp of the latter was destroyed to facilitate the better adaptation of the bridge-work, and after the bridge was set, gold fillings were put into the cuspid teeth, and they were built up in the same way as the centrals.

This case was done eleven years ago, and I have never had any trouble with it, nor has the patient. It is the only extensive bridge case that I have done. I have always questioned the advisability of permanent bridge-work, but this case appeared to me at the time to be particularly adapted to it, and the operation was performed.

President Brackett.—It seems to the Chair always gratifying to hear with reference to any structures of this kind that have borne the test of time. That is one of several good points that Dr. Smith has brought out in his statement in regard to this case.

Dr. Banfield.—Recently I replaced a permanent bridge with a removable one. It was composed of two bicuspid and a molar. Caps were made for the molar and bicuspid roots, and cylinders with the bridge attached made to slip over the caps. If an accident should happen, I can slip off the bridge and repair at my leisure.

President Brackett.—The Chair would like to ask if this bridge-work is supposed to be removed by the patient.

Dr. Banfield.—No, sir; the cylinders fitted so closely I was obliged to file them, for fear they could not be removed after being adjusted to the mouth. Even now it will take considerable force to remove the bridge.

Dr. Meriam.—I have had almost no experience in this bridge-work, and, I am very thankful to say, quite a limited experience in crowning. But from what I have seen it has appeared to me that we depended too much on soft preparations of gold for the support of bridge-work, and that the tendency of gold to spread in wear is a very important cause of the failure of such work. If some of the bridge-work was started with a little stiffer form of gold, there would of course be more trouble in fitting, but it would undoubtedly give better wear. The amount that a piece of twenty-two-carat gold will yield is considerable.

Dr. Moffatt.—I quite agree with Dr. Meriam that twenty-two-carat gold is too soft to use in many cases. I had a case recently which gave me considerable experience in that direction. The soft gold of which seamless bands are made had to be abandoned, and a stiff, heavy platinum clasp-plate used in its place. In a great many narrow bridges, where you want a very little plate, but still a very stiff appliance, a large flow of solder over a platinum and iridium wire, finished round or half-round, makes a very stiff and rigid plate.

Dr. Cooke.—I should like to ask to what extent the members have used crowns that are already prepared. The idea one gets from the cuts in the magazines is that all you have to do with ready-made crowns is to trim them up a little and press them into place.

Dr. Meriam.—I had in mind a crown put on by a neighbor of mine when I spoke about using soft gold. The band was easily spread, and was pressed into place so as fit the festoon of the gum beautifully; but it was soon found that the crown that was so easy for the dentist to spread and put on proved equally easy for the patient to spread and put off.

Dr. Allen.—I have attempted in two or three instances to use these ready-made crowns, but in each instance I have failed to secure satisfactory results, and have abandoned the attempt and finished the operation by making crowns in the usual way. I feel that I can work with better facility when making the crowns myself than by using ready-made ones.

Dr. Banfield.—Does Dr. Allen think that if these ready-made crowns were composed of eighteen- or twenty-carat gold, and of number thirty gauge, they would be of service?

Dr. Allen.—My trouble has not been with the yielding of the crown, but in adapting the band to the root and in getting the proper articulation. If I get the band over the root, I am not always sure of getting the crown in proper occlusion.

Dr. Grant.—Quite a little while ago I read an advertisement in one of the dental journals, in which some man—I think it was Dr. Land—claimed that he could attach amalgam or gold firmly to porcelain. I thought then that if he did it he must do it in some such way as the china painters put on gold in decorating. To see if it could be done, I made a solution of gold in aqua regia and precipitated it, washed out the precipitate, and after drying it, made a flux with that and nitrate of bismuth, using plenty of gold. I then made several crowns and set them on molar roots with amalgam. The amalgam made an absolute union with the heavily-gilded surface. You can get enough gold on a tooth by this method so that it will hold amalgam firmly. There is no question but what it is an absolutely perfect joint. I intended afterwards to try borax as a flux, but I never did it.

Dr. Meriam.—I think the receipt-books all give an amalgam that will adhere to glass without difficulty, and I have thought that one of these days we would find a metal that would adhere to porcelain in the same way.

Dr. Cooke.—I would like to ask Dr. Grant if he relied on the union of the amalgam and the piece of porcelain to hold the crown.

Dr. Grant.—Oh, no. The object is to get a joint there; but by getting such a complete union between the amalgam and gold the tooth is made additionally strong. You cannot do it with decorators' gold, because there is not enough gold there; you have to make the flux yourself.

Dr. Cooke.—I am not quite satisfied with this discussion. I wanted to learn something about crown- and bridge-work, and I should like to find out what the members think is the best crown to use; and I wish, Mr. President, you would commence and ask each one separately what method is preferred.

Dr. Brackett.—Suppose we begin with you. What kind do you prefer?

Dr. Cooke.—I think a banded crown is the best one to use. Have the band go around the root and under the gum, and the pin inside

set with cement. I prefer that to the crown that is simply held by the dowel.

Dr. Banfield.—If I were asked what was the best crown to use, I should be obliged to say, "It depends upon the case." At the present time I know of no one crown that would be well to use in all cases. In one I now have in mind, where the front teeth are short and very far apart, with sound roots, I cannot conceive of a kind of crown any more satisfactory than the all porcelain. A crown with any gold would look badly. I am soon to put on some crowns where the roots are weak and badly decayed at the labial surface, with recession of the gum. In such a case I would use a gold band to strengthen the roots.

The trouble I find with the Logan crown is that it is difficult to find one whose neck fits the surface of the roots; it is either too large or too small.

Dr. Preston.—I have nothing to say about crowns, Mr. President, but I brought a piece of bridge-work to show you, which I made July 29, 1839, and which was in use for nine years. I do not recollect that I ever did anything to the teeth until they were taken out. I made this without knowing anything about crowns, and it was intended to be permanently fixed in its place, being set in the roots with wood, and having gold pins in the two front roots. I put in a number of cases about the time at which this was done.

Dr. Moffatt.—Mr. President, I think that Dr. Preston more than bears me out in my statement that bridge-work is not a child of the present generation. Here is something that goes back over half a century.

Dr. Barker.—I believe Dr. Cooke's object was to bring out the preference of the different members for some special crown.

Probably practitioners will usually prefer that method which is to them the easiest. For a long time I used the Richmond crown pure and simple,—the band and the porcelain crown backed up and soldered to the band. I made and mounted numbers of them until Dr. Stowell, of Pittsfield, showed me in Montreal, a number of years ago, a method of his own. Since then I have mounted crowns according to the Stowell method. A description of his method can be found in the "American System of Dentistry." It is a simple banded crown, made by cutting off close to the porcelain the pin of a Logan crown, flowing pure gold around the pin, and soldering that bit of pure gold to a band which you have already fitted to the root. It is for me a simpler method and more certain than the

Richmond, and is preferable, particularly in the case of front teeth, as nothing is seen excepting the porcelain.

One of the principal objections I find to the Richmond crown is that you cannot rely upon your colors, and in one or two cases I found it very annoying. With the Stowell method you do not have this difficulty.

For a simple pin crown I use the Logan entirely. I consider it strong and simple and satisfactory in all points, with the exception which Dr. Banfield spoke of,—the fact that the neck is often too narrow.

Dr. Bradley.—My experience in crowning, Mr. President, has been somewhat limited. I have used the Richmond crown for a banded crown, mounting it with gutta-percha; but I use more of the Logan than I do of the Richmond, and I should say with considerable success. I have had a few roots split where a Logan crown was used, and also where the Richmond crown was used, though more rarely in the case of the latter. I use Dr. Evans's gold caps to a certain extent, and with what seems to me good success. There is one case which I would like to speak of. The patient was an officer in the army, who had nothing left of the right inferior first molar but two roots, and he asked me if I could not do something with them. The crown was entirely gone, and the roots were not even standing straight,—one of them laid over on the side. He said that food continually getting in these roots bothered him, but he did not want to have them taken out if it were possible to make any use of them. I took an impression of the roots in modelling composition and sent to Dr. Evans for two of his crowns, and after fitting them on, invested them in asbestos and plaster and soldered the two caps together and fitted them. The roots were not quite firm when I put the crown on, but they are a little firmer now. The gentleman says it is the best tooth he has in his mouth, and he gets a great deal of satisfaction from it. So far, I have been well satisfied with Dr. Evans's caps, and know of no case yet where there has been any difficulty in my use of them.

Dr. Grant.—I don't believe much in banded crowns. I have never had very good success with them. I don't think it is really necessary once in twenty cases to band a root. Of course I have seen a great many crowns that have been in use a number of years. I saw one not long ago that was put in by Dr. Moffatt over twenty years ago, before much banding was done. It was in the form of an ordinary pivot tooth, except the socket in the porcelain was of platinum, and there was a gold wire running through the wood pivot

pin, but the joint was just as good when I saw it as it was when it was first made.

A most important feature in any crown is to be able to remove it. Of course every one knows that there is no porcelain crown that will not break, and when one does break, it is a tremendous job to take the pin out. It takes more time to get it out of the root than it does to put it on, if you want to save the root. A method of crowning that I sometimes employ is to take a piece of gold tubing, which is cut to a length equal to the depth of the root-canal. Drive a square cutting tool through the gold tubing, and make a perfectly plain-sided socket similar to that of a watch-key. This tube can be set in any way you prefer, and a square pin is made to fit it. The tooth is soldered to this pin, and when the tooth, thus mounted, is placed in the socket, I have never known one of them to come out except by a straight pull. Of course they are liable to be broken, but new teeth can easily be put on.

Another plan is to bake a square or three-cornered platinum pin in the old-fashioned pivot tooth. The pin can be secured firmly in the crown by a flux of powdered flint glass and borax. Continuous gum body will answer, but the glass requires less heat.

In this way the relation of pin and crown are easily adjusted, while the result, in point of strength, is quite equal to that obtained by the Logan crown.

Dr. Meriam.—I would first, Mr. President, advocate the use of nitrate of silver in the treatment not only of the ends of the roots, but to a certain extent of root-canals, after preparing them for the pins.

Regarding a banded crown, if the joint is to be conspicuous I might not use one. For back teeth I should use the gold-band crown for men, and in all cases where the crown was to be subjected to severe use. For bicuspsids I would prefer the English tube tooth. The colors are so good that I submit patiently to the annoyance of grinding them to a fit, and they are big enough at the necks of the teeth to cover the roots. The Howland crown seems to me a very valuable crown where there is room for it. It requires a certain depth of the crown to hold the pin, and that may be an objection; and another is that it has had no one to push it, but has depended entirely on its merits to bring it to prominent notice. It is only just now receiving the attention that it should.

For back teeth I prefer a crown that I can remove, and also prefer to use gutta-percha in the roots, except where the canal is large; then I use cement.

Dr. Stanton.—The subject of crowns has been so thoroughly covered that it seems almost impossible for one to add anything to it. My extensive experience, to which Dr. Smith has referred, has been more in the way of repairing other people's work than in doing new work. When I first began practice, a large number of patients who had had crown- and bridge-work done for them fell into my hands. I have, consequently, formed some very decided opinions with regard to crowns, simply from the results of the experience of others.

From a personal stand-point I think the only fit crown to use is one with a band on it. I have seen so many fractured roots and so much decomposition of the end of the root from loose joints that I cannot but feel that the slightest play between the end of the crown and the root is fatal to the success of the operation. It does not matter how slight the movement may be, you are bound to have decomposition where it exists, and, strange as it may seem, it will follow the pin up into the root.

The recession of the gum and consequent showing of the band have been spoken of. I think a Richmond crown can be put on incisors without the band showing at all.

I do not think that the presence of the gold or platinum causes any recession whatever. I have seen banded teeth which have been in use for five to fifteen years, and, so far as I have been able to discover, the gums do not show the slightest indication of receding. If you put an all-porcelain crown on an incisor, you are dependent entirely on the pin for the strength of the tooth, and if there is heavy pressure brought to bear upon it, then either the porcelain crown will give way or the root will split. These results, of course, will reflect upon your skill and judgment. To my mind the lesser evil would be to put a band around such a root, even though it did show somewhat. But I have found, if a tooth is properly ground with a very thin corundum-disk, that you can carry the thin edge of the band under the gum in such a way that it does not show.

Supposing, however, that the band does show, it is infinitely more to your credit to use it, and have as a result a tooth that will last until the patient is obliged to lose his teeth from natural causes, than to endeavor to perform an æsthetic operation which will look well, but which is unreliable.

Cases of bridge-work come to grief from one of two causes: either decay will have progressed sufficiently to loosen the caps,—a process which is fatal to the whole bridge,—or there will be so

much pressure brought to bear upon the supports that a tooth is pulled out. The latter condition may be found in removable bridges.

Dr. Smith.—I would like to ask Dr. Stanton whether, after considering the evils of both permanent and removable bridge-work, he believes in bridge-work of any kind.

Dr. Stanton.—That is a very difficult question to answer. Many cases of bridge-work are very successful. I know of an instance where a person has worn a full upper set and two partial bridges on the lower jaw for fifteen years, and they seem to be in as good condition to-day as when I first saw them. You will often meet with bridges supporting one-third to two-thirds of an upper or lower set which have been used for years and are still perfectly solid. On the other hand, one out of the next half-dozen that you see will be loose from a cause which you will never learn, because it is impossible to obtain the history.

Bridge-work was very popular at one time, from the prevalent idea that loose teeth would be tightened by its use. There never was a greater fallacy in the world. One of the essentials for a successful bridge is to have firm foundations. Even then it is impossible to say that it will surely be a success. I never guarantee that a piece of bridge-work will last. Where bridge-work can be put in and the structure made light, a removable bridge is preferable to a permanent one. I have found it interesting to note how much some people will have bridges repaired before they will give them up; they seem to have an affection for them, and will pay enough in the way of repair to get a new appliance or an artificial plate.

Dr. Smith.—Dr. Banfield referred to a crown which he said I was very enthusiastic over. It is simply an idea of putting a hole in a crown, which I got from Dr. Perry, of New York. In the old-fashioned incisor pivot tooth the hole took such an angle that the tooth was made very weak. In case the tooth was ground for an occlusion, it became weaker still. Dr. Perry had some crowns made with the pivot hole pointing straight towards the cutting edge, and the result is a much stronger tooth.

No more artistic work in prosthetic dentistry can be done than to crown a root in the front of the mouth so that it will appear entirely natural. I had a case where I destroyed the pulps in the six front teeth and put on crowns. The method I used was to cut the labial portion of the root down under the margin of the gum and fit accurately a Perry crown. A platinum and iridium pin was set in the root-canal with gutta percha, and then the crown set with cement. In doing this work crowns had to be carved for the case

and many had to be carved before satisfactory ones were obtained. While waiting for the carved teeth, ordinary teeth with very short holes were used.

In order to remove crowns set in gutta-percha, Dr. Payne, my associate, suggested the following plan: A small bottle was fitted with a cork, and through the cork a tube was passed. Through this tube a few threads of wicking were drawn, and thus an alcohol lamp was made which gave a miniature flame. This flame could be carried to the tooth, and sufficient heat applied so that it could be easily removed.

President Brackett.—Dr. M. W. Foster, of Baltimore, years ago, gave me an instrument which, in its use, bears a resemblance to the miniature alcohol lamp that has been spoken of. It was made presumably of soft steel, with a handle of wood. The steel end had a deep V-shaped groove, and it was intended to be heated and slipped over the crowns to facilitate their setting in gutta-percha and their removal.

Another means of applying heat is by a continuous blast of hot air, produced by a syringe. With this a tooth and its setting may be made very hot.

Dr. Meriam.—Dr. Baycock sent me a little lamp of the same sort as Dr. Smith describes, except that it was made from a medicine-dropper instead of a bottle. It can be used as a small lamp for heating or as a flash lamp for cavities.

President Brackett.—It is hard to draw the line between this discussion and the demonstration of the use of a new furnace for porcelain fillings and crowns, by Dr. Bartlett. If Dr. Bartlett is ready, we should be glad to have him explain it to us.

Dr. S. R. Bartlett exhibited a small gas furnace, made by the Detroit Dental Manufacturing Company, designed for baking porcelain fillings and crowns. The muffle, which is made of platinum, is just large enough for one or two teeth, and has a platinum tray for holding the piece to be baked. Dr. Bartlett gave a demonstration of the use of this furnace by baking an incisor crown in just two minutes. The tooth used was an ordinary plain rubber tooth with iridio-platinum dowel held in position between the pins of the tooth, the band for the root being made of platinum with an investment of silex and plaster which surrounded the upper portion of the dowel and inner space of the band. The tooth thus invested was formed to the proper contour by Allan's continuous gum body, which covered the labial part of the band and was made continuous with the neck of the tooth. The crown was then baked; the time

required for heating, baking, and cooling being about ten minutes. By this process of making crowns—which Dr. Bartlett does not claim as original—the objection to having the metal band show when the gum recedes is obviated.

WILLIAM H. POTTER, D.M.D.,
Editor American Academy of Dental Science.

ODONTOLOGICAL SOCIETY OF PENNSYLVANIA.

THE regular meeting was held at 1228 Walnut Street, Philadelphia, May 13, 1893.

The subject for discussion was "Corrective Dentistry: Its Present Status."

The President, Dr. Louis Jack, called upon Dr. Guilford.

Dr. Guilford opened his remarks by stating that Dr. Bonwill could not have read his work on orthodontia carefully, for if he had he would have noticed a description and illustration of the appliance described by Dr. Bonwill, and properly credited to Dr. H. A. Baker, of Boston.

Continuing, Dr. Guilford said, "Appliances for the correction of irregularity are so varied in character and great in number that we can only take time to speak of them in a general way.

"In the earlier days force was principally derived from the elasticity of metals in the form of bars and springs, sometimes assisted incidentally with ligatures and wooden wedges; but after the introduction of caoutchouc, rings cut from rubber tubing and vulcanite plates were added to our list of materials available for exerting power. The latter, on account of their great adaptability and ease of construction, for many years largely superseded the use of metals, but the tendency nowadays seems to be to return to the use of metallic appliances, not only on account of their greater power, but because of their directness of action and their occupancy of less space in the mouth. In their construction the more expensive metals, such as gold, platinum, and their combinations, were formerly used; but with the advent of steel in the form of piano-wire and the introduction of German silver, it was found that equally efficient appliances could be constructed and at less cost. For this reason they have come into very general use. The chief objection to their employment is their oxidability, which soon renders them unsightly and seriously interferes with the movement

of parts, such as nuts upon bolts and rods in tubes. To avoid this I was led to use platinized silver, which does not tarnish like German silver, and which, unlike steel, can be joined with hard solder without injuring its properties.

"It is an alloy composed of one part of platinum to two of silver, and was introduced from England, where for many years it has been used in the form of wire posts for the support of tube-teeth and in sheet form as a base for partial dentures. Its elasticity is little less than that of platinized gold, while its cost is about one-third that of gold.

"Its many valuable properties render it a most useful and serviceable material, and I now use it almost to the exclusion of other metals in the construction of all parts of regulating appliances.

"Rubber or vulcanite plates serve an admirable purpose in expanding the arch and in producing many simple movements of teeth, but the necessity for removing them at times for cleansing often tempts the patient to remove them when they should not be removed, and thus our results are frequently delayed and sometimes greatly interfered with. It is best not to confine one's self to any single system or method in regulating, but to use such parts of any method or to devise such appliance as seems best adapted for the case in hand.

"In regard to retaining devices, I think that in nearly all cases they should be of such character as to be non-removable, for in removing and replacing them the teeth are more or less disturbed, and this hinders their growing firm in their new positions. Retaining fixtures serve their purpose best when cemented to the teeth and left there for a period of not less than six months. Appliances attached to teeth by means of bands or clasps will after a long time cause injury to the teeth, but when cemented in place no injury will result."

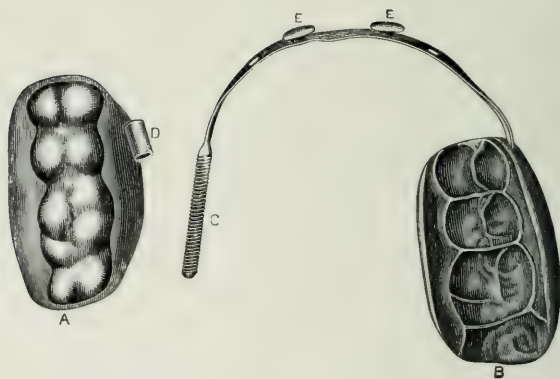
Dr. Darby.—I think since the year 1871, when I heard Dr. Walter Coffin, of London, describe his method of using rubber plates in connection with piano-wire springs, I have used them more than ever before, and with increasing favor. There are many cases of irregularity where a rubber plate and a spring of piano-wire are all that is needed to accomplish the desired correction.

I have frequently corrected difficult and complicated cases with a single rubber plate to which had been attached springs and screws, some at the time the plate was made, others subsequently, as the malposed teeth had moved into their desired position.

The rubber plate possesses two desirable features,—namely, a



FIG. 1.



A represents the masticating surface of the movable shoe, showing gold facing.
D represents the inner surface of the fixed shoe.
C, the screw which fits into the screw cylinder *D*.
E shows the buttons to which the india-rubber bands are attached.

minimum amount of skill for its construction as well as a minimum expense, which is often a serious matter when precious metals are used and a number of appliances required.

To-day I inserted a little fixture for the purpose of pushing into the arch a lateral incisor which was within the line of the other teeth. There was room for it between the central and cuspid, but it was held in its abnormal position by the occlusion of the inferior lateral. A rubber plate was made capping the molars. That portion of the plate fitting against the palatine surface of the incisors was left quite thick, and opposite the malposed lateral a screw was embedded in the rubber. The screw was headless, and the slotted end of the screw rested upon the palatine surface of the lateral. The patient was given a small screw-driver, and requested to back that screw out a turn or half a turn twice or thrice daily, and then force the plate into position. As the plate bound the molars tightly, there was no slipping from its position when once forced into place by the lower teeth. If the girl is faithful in her use of the screw-driver the tooth will be in line in two or three weeks.

Such an appliance need not cost over two or three dollars, and the patient corrects the irregularity.

Rubber plates are a little cumbersome, and they are in many cases unclean, but this is the fault of the patient.

While I would not recommend them in all cases, I would not like to discontinue their use, nor have them condemned without a hearing.

Dr. Jack submitted a plate that he generally uses for carrying teeth out or drawing them inward. The plate was passed around among the members, and after illustrating the points upon which he wished to make his remarks by a black-board drawing, he said,—

“I want to call your attention to a form of plate I have been using for a great many years for the general purpose of aligning irregular front teeth and for forcing outward or inward the eight front teeth of either arch.

“In reference to the alignment of teeth, carrying them in when they are too far out and bringing them out when they are too far in, I use this plate almost invariably. It is composed of two pieces of vulcanite joined by a band of gold. (See Fig. 1.)

“The posterior teeth are made the base of resistance by covering the second bicuspid and the molars of both sides by two separate shoes of vulcanite, which extend at either side of the teeth but a few lines beyond the margin of the gum. To give these shoes strength and to enable the patients to masticate upon them, they

are surfaced with gold swaged to the form of the ends of the teeth. These gold facings are vulcanized to the shoes in their proper places.

"Some preliminary preparation of the cast is required to enable these shoes to hold firmly their position. They should go on with a little springiness. The cast is trimmed with a suitable instrument to take a shaving from the teeth at the neck, and also a shallow groove should in most instances be made in the plaster, at the gingival margin. The proper amount of cutting is quickly gained by experience.

"These bases of support for the movement of the teeth are connected by a narrow band of springy gold, one end of the bar being secured to one of the shoes, the other end being attached to the opposite shoe by a male screw fitting in a screw-cut tube or, with proper precautions, vulcanized into a projection on the outer plate of the shoe.

"The reason for this plan is that by turning the free end of the appliance the bar may be reduced or increased in length. If in any given arch a tooth or more is projecting and others are depressed, the bar is brought into contact with the most prominent tooth, and a piece of elastic rubber is placed between this point of contact, at the same time a rubber ring is carried over each of the teeth which are within the arch and is drawn through a hole opposite the tooth and extended to a button. On the next day the bar is screwed up enough to be again in contact, when a new pressure may be made or the tooth is rested, as the conditions require. If the depressed teeth are sore, they may be rested by tying through the same channel as the ring had passed. I remove these plates daily, each time making a gain in the progress. It is important to make this daily change for the sake of cleanliness, the patient brushing the teeth while the further preparations are being made.

"As before intimated, all the front teeth may be moved at the same time either outward or inward.

"Rotation may also be conducted by the various attachments made for that purpose by connecting the rubber band to the attachment, and many modifications of this simple description will occur to meet the exigencies connected with the alignment of the teeth.

"It is almost needless to state that the impression of the teeth should be taken with plaster.

"This method may be made useful in the treatment of cases at a distance whenever either of the parents of the child has the intelligence to comprehend the mode of operation of the plate and is capa-

ble of applying the required instruction. In this connection I have conducted the correction of a great protrusion of the upper teeth and concurrent depression of the lower arch for a patient living a thousand miles from me, the mother each day making the necessary changes of the plate or ligatures. The upper teeth were forced backward in the manner described, and when their position was corrected, a similar plate was placed on the lower teeth, when they were gradually brought outward into correct relation with the upper arch. This necessitated but three periods of attention on my part.

"The only originality in connection with this appliance is the division of the old form of upper plate which was used to separate interlocked arches and to connect these by the screw at one end of the bar. I present this method to you as comprising many advantages for the purpose for which it is intended, and in this purpose is included the greater number of irregularities we have to treat.

"For the rotation of teeth and for bodily moving them on the line of the arch, my opinion is that no means are so effectual as the attachment of a screw connected with fixtures which are cemented to the base of resistance and to the irregularly-placed tooth.

"In reference to retaining fixtures, I employ the methods Dr. Guilford has mentioned to you. I invest the teeth with a fixture which is cemented firmly in place, sometimes covering the teeth entirely, at other times leaving a portion open. Sometimes I make them very extensive, covering the incisors, cuspids, and bicuspids. These are cemented on with oxyphosphate of zinc, and are worn from six to nine months."

This closed the discussion of the subject.

Dr. Deane, under "Incidents of Practice," asked the advice of the members as to how to proceed in a case he had, where a boy, about thirteen years of age, had fallen against a curb-stone and broken off the right central about three-fourths of its length; the opening at the apex of the root was quite large. Would it be better to restore the crown? The root is in good condition, except that the apex of the root is not closed. Should it be extracted or left as it is?

Dr. Truman suggested the use of oxychloride of zinc.

Dr. Darby stated that in a somewhat similar case he made a little piece of gold to go into the canal, with a thread cut upon it. He suggested mounting the crown.

Dr. Gaskill stated a case where a tooth had been broken off and subsequently gave the person trouble. Upon examining the tooth

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he found an opening an eighth of an inch in diameter. A piece of tooth-brush handle was taken and made to fit the cavity exactly, and coated with chlora-percha, inserted in the root, and a crown mounted. It had served the purpose very well, with no subsequent trouble.

Dr. Boice stated that he had a case a number of years ago in which the apex was larger than any part of the canal. In drilling it out he had to hold the tooth. Finally, it was filled with cotton, expecting the patient to come back in a few months, but it was sixteen or seventeen years ago and had given satisfaction all that time.

Dr. Jack stated that he had the history of four such cases. He measured the exact distance to the end of the root with a broach; then fitted a steel probe by filing it to fit exactly the apical opening, and cut it off at a point where it would not go through; this gives the exact size of the opening; he then prepares a cylinder of gutta-percha on a warmed porcelain plate to the proper size; then cuts a section of the cylinder at a point a little larger than the piece of steel. This is next attached to the probe, carried up and forced by measure to the proper place, the gutta-percha being obliged to adapt itself to the form of the canal at the apex. Afterwards the remainder of the root is carefully filled.

Dr. Guilford called the attention of the members to the adaptability of platinized silver for dowels, being less expensive than gold, and standing any amount of heat any article can be subjected to except platinum. The doctor stated that he frequently soldered it with 20-carat gold. It has not quite the stiffness of platinized gold, but where less stiffness is required it answers the purpose perfectly well. It can be bought of Ash & Son, New York.

Dr. Bonwill then read a proposition for the consideration of the Society in regard to the proper disposition of patented articles.

After Dr. Bonwill had read his paper, the consideration of his proposition was taken up and opened by Dr. Boice, who said that he understood Dr. Bonwill had something which he wanted to present to the Society; that he had given a good lecture on patents but was not able to see that the doctor had given the Society anything. Dr. Boice further said that he did not feel that he could offer any motion accepting anything that had not been offered.

Dr. Bonwill answered that if there were no clause in it upon which they could take action they might accept it and place it before the American Dental Protective Association.

Dr. McQuillen stated that, as he understood it, Dr. Bonwill

wanted the Society to go on record as favoring patents of all kinds, and to present this paper with its endorsement.

Dr. Truman.—Dr. Bonwill desires that this Society shall refer this matter to the American Dental Protective Association. In doing that, as I apprehend it, we do not endorse it.

Dr. Darby moved to place it before the American Dental Protective Association, with a disclaimer of any endorsement.

This motion was carried.

CENTRAL DENTAL ASSOCIATION OF NORTHERN NEW JERSEY.

DISCUSSION ON DR. G. LENOX CURTIS'S PAPER.

(For Dr. Curtis's paper, see page 486.)

L. Ashley Faught, Philadelphia.—I wish to compliment our good brother who has so ably presented this subject to us this evening. It is a great pleasure to listen to a paper so well written; and though I may differ with him in the main conclusion, I most heartily agree with him in all that he has said in advocacy of anything leading to higher professional attainments. Post-graduate study is a subject in which I have been interested for many years, as long as—perhaps longer than—any one present here to-night, for I see that the idea was sprung upon the profession in its literature at the organization of the Post-Graduate Dental Association of the United States, in the year 1889. The only reference I can find before this is an article written by myself in 1885, and published concomitantly with one by Professor Barrett, in the same year. This article of mine was the culmination of a personal attempt in 1880 to start such a school as a private enterprise. Thus considering the subject for a period of over twelve years, I entertain views to-day diametrically opposed to those of my first conception. I will in a few words try and tell you the reason for such change. In the first place, we should note that post-graduate study involves three phases,—a mental development, a manual development, and that happy combination of the two, a higher professional development. I will consider each in turn. When I was a young graduate of dentistry, filled with the fire and vigor of youth, and animated by the laudable desire to succeed, I wrote upon my tablets that success was to be obtained only by “reading like smoke.” The midnight oil was burned, and

early candle-light was used, even the best part of sunlight was devoted to study, seeing that the slow growth of practice left many of its brightest hours unoccupied. As a natural result, I was not only up at all hours, but I felt a manly pride in being "up" upon all subjects. The college habit of acquisition was never lost, but the mystery to me was why men who had been twenty years or so in practice did not seem to be able to keep pace with me. The mystery now has been solved; experience in this matter is the best teacher. I now know—what they then knew—that when one is in full practice, busy each day with its full duties and cares and worries, the physical strength and the mental strength become so sapped that it is well-nigh impossible to do more than that study necessary to the proper conduct of the cases committed to our care.

The appropriate deduction from this is that the value of post-graduate study in the development of a theoretical knowledge is at a minimum at the time of professional career where it is the most needed.

A word now regarding "manual development." Upon this point the essayist of the evening has laid special emphasis. I think it is admitted as an axiom, in all the arts and sciences involving digital execution, that unless one possesses physical endowment, training the best and cultivation the most constant will never develop power beyond a certain point. It is true that much of the awkward and crude may by special drill be removed, but the finer touch so necessary to a finished service, as in crown- and bridge-work, continuous gum-work, or the construction of regulating appliances, etc., can never be attained where native qualities are deficient. The few and not the majority possess these native qualities. Post-graduate instruction, therefore, in this direction is of limited possibilities.

The higher professional development remains now for our consideration. This undoubtedly is the most worthy aim of post-graduate study. Here, in the main, will lie its value,—making better that which is poor, and perfecting the few destined to be shining lights; but to my mind, gentlemen, post-graduate study can never repair the loss the profession has suffered by the abolishment of preceptorships. The absence nowadays of preceptorial teaching I believe to be a positive loss to a dental career, and one which can never be replaced. The foundations are everything, and cannot be too carefully laid. Time spent here is well spent in grounding principles. No spring and fall courses at colleges can take its

place. Statements to the contrary in college announcements are a blandishment and a deception. It is ante-college training and not post-graduate study that is the demand of the hour. Colleges should be provided with aged and experienced demonstrators instead of young and recent graduates in this important department. The attention here advocated cannot but result in higher professional development. Refinement of material before and during instruction will produce a depth and richness in the finished product that no gloss and varnish applied afterwards to the crude can ever even approximate.

Dr. George E. Evans.—Of the many subjects of an educational character presented for the consideration of the dental profession, none at present is more deserving than post-graduate study. As to what should be the standard course and length of study to properly educate and entitle the dental student to receive his degree are questions which, after years of discussion, have finally been decided, and the decisions have been accepted by all recognized colleges.

The benefit of these innovations is already being felt, and the future results will be to restrict the practice and generally elevate the grade of dentistry by classification in a profession. Impartially considered, the educational advantages that the average student has availed himself of by the time he has graduated consist actually of only a general, not a thorough, comprehension of the subject of dentistry. The future of the young practitioner is thus left to himself, as his alma mater has sent him out in the world as his own master. Then, or a little later, if he is progressive, the subject of post-graduate education will naturally engage his attention. The value of post-graduate instruction, in my opinion, has been presented by the essayist of the evening in a very liberal and concise manner. Facts and collateral matter set forth show a most careful consideration of the subject; therefore, my discussion will partake more of the form of endorsement and comment than criticism.

That until within the last few years many students were graduated from dental colleges and entitled to practise the science and art of dentistry only partially educated, is undeniable, but at the present time this, I consider, belongs to history. An elder profession, like the medical, when presuming to discuss this subject in relation to dentistry, should not forget that it has much to consider respecting its own colleges, as to the manner favored students in some instances have been coached in their studies and favored in their examinations on subjects involving a knowledge of surgery and methods of procedure in practice, which leaves it open to comment

and criticism on the subject of "partial culture." But, owing to the educational standard adopted by the National Association of Dental College Faculties, the stringent regulations enforced, and the extension of the term of study from two to three years, and also to the watchful eyes cast and examinations required by State Boards of Dental Examiners, the day when dental students can graduate easily, or receive license to practise unqualifiedly, is past. That a student in a three-years' course at a dental college will receive a fair education in the scientific branches will be acknowledged, so must the fact that a large proportion of his time will be spent in their study. But in dental art and mechanism his education will be more theoretical than practical. In short, he has been taught how he should practise dentistry, but he has yet to learn by experience how it is to be done successfully. This experience will demonstrate to him how much he knows and what skill he has to acquire before he can assume the rank of an operator or expert in any one of the special branches.

The object principally of extending the course of study to three years has been to give, during the third year, better manual training and practical education to students before graduation. But even this extension of time, especially when the curriculum of study has been somewhat extended, and a practical knowledge of such a branch as crown- and bridge-work is required, as it is in the leading dental colleges of this country to-day, leaves but limited time for the acquirement of skill.

Under these circumstances, after graduation and a brief term of practice, it is that the subject of a limited course of post-graduate study and the benefits that could be derived from it will become apparent. To be a successful practitioner the dentist as an operator must be master of what he undertakes, so as to inspire confidence in his patient, insuring for him the best results, in their broadest sense.

Most all practitioners of dentistry favor one special branch more than another. This preference usually takes time to demonstrate itself. A limited course of instruction of a high grade in some preferred branch, in such cases, must necessarily be fraught with interest, and prove advantageous.

The essayist refers to those who entered on the practice of dentistry without a college training who would be benefited by a post-graduate school or a practitioner's course. There also might be included those whose attendance at college was only of a nominal character, sufficient to secure a degree, and a few who graduated many years

ago, to whom more modern methods of procedure in practice could be demonstrated advantageously.

The idea of making post-graduate instruction obligatory, I think, would not be proper. The certificate of graduation is one entitling its possessor to practise. Graduates become scattered, in some cases even to foreign countries, and the actual need of post-graduate study in after-years will largely depend on the natural ability of the dentist, the attention he gives to matters which will tend to advance him in knowledge, the character of the field of his practice, and the professional atmosphere in which he moves.

That we have not a post-graduate school as yet, constituted with a corps of instructors such as the essayist describes, is admitted. There are various reasons for this. The services of those learned instructors are not to be easily influenced, bought, or commanded as their time is already occupied to great pecuniary advantage. The preparation and delivery of lectures and the giving of clinics would require considerable time that could not be given for little or no remuneration.

One reason why post-graduate schools have not been added more generally to colleges is that every liberal college is more or less influenced by the wishes of its alumni. The alumni of dental colleges are, as a rule, not favorable to post-graduate schools, as ordinarily conducted, as their advantages are open to all classes of practitioners. In short, the college graduate does not care to return to study in the same ranks with practitioners who are non-graduates, or of questionable standing. In these respects, and in others which might be mentioned, the privileges of a post-graduate school should be liberally but properly restricted, so that its object could not be perverted.

The essayist, in my opinion, very correctly infers that but a small number of practitioners are well versed in the various branches of prosthetic dentistry, especially in crown- and bridge-work. Respecting the invidious reflection that many endeavor to cast on prosthetic dentistry, I will state that when I hear a dentist in a boastful sort of manner remark, "I do no mechanical work," I frequently think, Is he naturally endowed with or possessed of mechanical skill required for the construction of an artistic piece of work, or does his whole embodiment of soul dwell in just that *one* thing in dentistry, the operation of filling a cavity in a tooth? For who will say, who will *presume* to say, in this day, at this period of an advanced state of dental art, that he who can fill a tooth, an operation the difficulties of which are reduced to a minimum in compar-

ison to what they were thirty odd years ago, by improvements in instruments and the use of rubber dam instead of napkins, is to be classed as working in a sphere where more talent, knowledge, and skill are required than in gold-plate and continuous-gum work, the difficult operations presented in crown- and bridge work, and oral deformities, which involve collaterally much that is included or connected with operative dentistry? In presenting the subject of post-graduate instruction, Dr. Curtis has omitted reference to the Post-Graduate Dental Association of the United States, which, as set forth by its circular, is an organization solely engaged in the work of educating dentists. By different courses of reading it aims to reach every class of dental practitioner. These courses of reading are divided into pre-graduate and post-graduate courses; the one designed for the non-graduate, the other for the graduate. The classes organized and to be organized are as follows: A, B, C, and D. Class D is a five-years' course, at the close of which, on passing a successful examination, the degree of Doctor of Oristry is conferred, which undoubtedly will take high rank as a degree.

Full information respecting the Post-Graduate Dental Association can be obtained by addressing the secretary, Dr. Louis Ottofy, of Chicago, who has given the subject much time and attention. In conclusion, I will state that dentistry is constantly broadening its science and perfecting its art. No limited period of time can be mentioned as sufficient for its acquirement. Like all professions, it will always offer a field for progress and improvement. The establishment of just such post-graduate schools as have been so graphically portrayed to us this evening by the essayist is a "consummation devoutly to be wished." Like the post-graduate medical schools, their tendency would be to elevate the grade of the many practitioners who would be willing to avail themselves of their educational advantages.

Dr. G. A. Mills.—Mr. President, as you very kindly invited any one who may be interested in this matter to speak upon it, I will avail myself of the opportunity. About seven weeks ago, Dr. Curtis called my attention to this paper which he intended to read, and asked me if I would be willing to say something upon it, and I told him there was no subject that I would more gladly speak upon.

A man who has been in practice for forty years, as I have been, and who has brought to it a sincere desire to be as good a practitioner as possible, and who in the beginning felt the need of many aids that we now enjoy, will best appreciate the things that come up which promise to be helpful.

This matter of post-graduate schools is a subject that has been very little considered, but which ought to be one of the most important that can come before our profession. It is a subject that was in the mind of one man for a good many years; no one in the profession ever gave to it more thought and attention, probably, than Dr. Atkinson, and he set out to put it in practice in his own way. I think every gentleman here will bear me out in the statement that the matter of clinical instruction which Dr. Atkinson introduced in 1862 was a stepping-stone to this one of post-graduate schools. Every man who has had the advantage of clinical instruction knows how much has been gained by it; yet, while it is a fact that clinical instruction was a great help to us, it falls far short of the demands of to-day. We too well know that clinical instruction is beginning to go out of fashion; it no longer holds the place it did in New York City. I have been in the active movement of the profession, and studied it, for the last thirty years, and I know something about what it has done in the development of our practice in that time. I accept, in general, the remark that Dr. Curtis puts forth, although he quotes it from another party: that there is nothing truer in relation to the subject of dental education to-day than the fact that the dental profession is largely in a condition of what is called "partial culture." No man will accord greater credit to the schools of our profession than myself. I honor very much the men who have been engaged in them. I think no class have shown a more self-sacrificing spirit than those at work in them; they are dealing earnestly and constantly with the question of dental education, but the very fact that they are so engaged makes it impossible to give the fuller need to the student.

Every man who is conversant with the subject must admit that the average students who go through a course of study in the dental colleges come out lacking in thorough practical instruction. Old Dr. Riggs told a story about a visit of his to Philadelphia, where some boys began asking him questions. One of the young men had a head of large dimensions; the doctor saw what he was aiming at, and he said, "Boys, I have a farm near Hartford, and I have studied on it, among other things, the insect family, and I have noticed the fact that the humble-bee is the biggest when it is hatched." Many students might profit by remembering this story.

There are some questions confronting the dental profession to-day of very grave importance, and they will require wise heads

to answer them. Among them is the question of post-graduate instruction and the question of legislation for the benefit of the profession. I have for a long time been an advocate of post-graduate instruction, and I believe it should be brought about in our profession at an early day. We have a great many men who can do some things better than they can do other things, and better, perhaps, than others can do them, and to my mind post-graduate schools would be a good field for that class of men. If a man can do some one thing better than others can do it, let him exercise his talent in that direction. It is a fact that few men are fitted to become general practitioners. If a man takes up one branch of the profession in which he happens to excel he will accomplish more good for the profession and for the public than if he were to give his attention to branches in which, perhaps, other practitioners may excel him. The question of dividing up the profession into specialties has been largely discussed, and there are different opinions upon it; but I think the time is coming when special practice will be more in vogue than it is to-day. We have evidences of it everywhere. We see some men who excel in certain things, and who are more and more devoting their attention to those; one man excels in crown- and bridge-work, another in filling, another in correcting oral deformities, another in oral surgery, and others are more successful in what is called prosthetic dentistry, and their practice falls more and more into those special lines.

Dr. Roosa, of New York, whom I have known for many years, has devoted his attention to developing a post-graduate school in connection with the medical fraternity, and he has brought it to a position of prominence and success. Any man who wants to know anything about the working of post-graduate schools in connection with the medical profession will be able to find it out by examining the methods and results of that school. Dr. Roosa had many difficulties to overcome, but he has energy and ability, and the effort is recognized all over the world as an educational success, while financially the schools are above par. They have the support of the Vanderbilts and other men of wealth, and do not want money for developing hospital helps of their own. A school of that kind in our profession is needed in New York, and if there are men who have the ability and the personality to take hold of such an institution, I have no doubt that there will be found a patronage for it that will carry it to eminent success. I do not know of any place where such a school could be better established than New York City. The time will come when they will be found in many large

cities. Dr. Curtis is of the opinion that they would be of very great advantage to the regular schools.

As to Dr. Curtis's idea in regard to making attendance at post-graduate schools obligatory for graduation, I have not considered that point; but I do believe there is an immense advantage to be gained if young men could be brought under such an influence. A school of that kind, to be of any use at all to students and the profession, must be conducted by men who have proved themselves to possess superior ability, and who have had large experience in the practice of their profession,—men who can command respect,—and such men only could expect to receive the patronage of dentists who want something beyond what they have already attained.

The times have changed very much from what they were in former years. The time has been when the student went into the office of a practising dentist, and there had the opportunity to observe operations, and the advantage of the practical instruction of his tutor; but that method of dental education is going out; the schools have instituted new arrangements, taking the student *de novo*, and undertaking to educate him entirely in the college. The result is that the student who comes out of these schools knows very little about his profession in a practical way. There are some young men who will take advantage of every opportunity to push themselves, and who are exceptions to the rule; but the majority of the pupils sent out from the dental schools are unfit to practise. They have to learn by practising on the people who employ and pay them. And it is a fact that the public is beginning to know something about dentistry, and is beginning to discriminate between the men who know and the men who do not know. There is a feeling growing up in the community that the people are being preyed upon too much by young practitioners. I do not say that with any feeling of unfairness towards the young men; it is true that they have to make their way, and they generally do the best they can; but the fact remains that the people do know something about dentists and dentistry, and they prefer the experienced practitioner, if they have to pay for services; therefore young men must embrace every opportunity to prepare themselves for successful practice, and I think that in the establishment of post-graduate schools an opportunity will be given for gaining, in a shorter time, the knowledge and experience that they cannot afford to miss.

Dr. Luckey.—Mr. President, I have not very much to say, and there is not a great deal to be said after what we have heard on the

subject; but in my humble opinion the place and the time for the work of post-graduate schools is in the primary course of the college. If the colleges already established, and which draw upon the community for the material from which to carve and hew out a supply of dentists for the country, would do their duty by those students that they promise in their catalogues to do, and that the public and the profession expect them to do, there would be no occasion for post-graduate schools, except for the preparation of a few men for some particular lines of work. Post-graduate study we expect every man to follow, but it does not necessarily imply attendance at post-graduate schools. If a member of the profession is found to have a bent for a particular line of work, and feels that he is lacking in thorough equipment, it would be well for him to take a post-graduate course.

I do not think it is necessary to dwell upon this subject. I think the whole thing has been settled in the question of thoroughness in the primary education of the schools.

Editorial.

SUNSHINE AND SHADOW.

IN these early summer days the mind instinctively turns to the green fields and the purer air laden with the aroma of June roses and longs for the restful quiet denied in the rush and tumult of city life.

The demand for change, for new scenes, and an annual absorption of experiences other than those which the routine life of the year has given, is a part of our being, and should be accepted as necessary to it and adding to our capacity for more extended and healthful labor.

The sedentary life of our profession is not by any means the least of the evils connected with its practice. Hour by hour the dentist is placed in unhealthful conditions, day by day he faces the same routine of work, the same exacting fears of those under his care, feels the same nervous exhaustion from over-labor and the still more unendurable reflected nervous restlessness of patients, until nature rebels and he is forced to lay down the excavator and plugger and seek a rest denied him in his immediate surroundings.

The practice of dentistry is beyond question one of the most laborious and destructive to health of all the professions. The vitiated atmosphere, the constrained positions, the nervous strain, the unnoted pressure of the chair upon the body, resulting oftentimes in serious lesions, the monotony of practice,—all combined render it difficult and unsatisfactory if the reason be not allowed full supremacy in governing it.

On the other hand, if the operator will discard the idea of wealth and be satisfied with a reasonable competency, shorten the hours of labor, lessen the strain, admit the sunlight to his apartment, avoid mere routine practice, and make every operation a study and means of mental growth and advancement in scientific knowledge, it becomes the most agreeable and fascinating of employments.

The mistake made by many men is that they become not the willing servitor of patients, but their slave. They permit dictation of hours and yield moments to urgent request that should be devoted to physical recuperation. The warning that always comes from an overstrained nervous system goes unheeded until the final breakdown, when perhaps it may be too late; the verdict is rendered, sentence pronounced, and the individual leaves the ranks forever.

It would be interesting and very instructive if those who have lived longest in the practice of dentistry and maintained a fair share of health to old age could give their experience. Unfortunately, one by one these are passing away and have left no word of instruction or warning to younger men. The record of death of the latter has always been large in our ranks, and, in the experience of the writer, it has invariably been of those who have failed to remember that there is a limit to human endurance. We have often sounded the warning into unwilling ears, and have stood as often by the open casket with the vain regret that the advice was not heeded.

The hours of work in dentistry are too long. As practice grows the eager youth adds on to these until, in many cases, they extend far into the night. The strain of an eight-hour period is sufficient for any toiler, whether that be over the operating-chair or at other labor. Change of occupation is necessary both in manual and mental work, and when these are combined, as in our practice, it becomes imperative. It is said of Bancroft, the historian, that he would take an intermission in his labor and have a novel read to him. This was not only a rest, but infused new life into his im-

agination. It is trite to urge this alternation of work. All understand it, but few adopt it.

It is asserted by bacteriologists that sunshine is deadly to all micro-organisms. If this be true, how dangerous it may prove to remain day after day in the shadow of a northern light, and exchange this only for the heated gas of the laboratory!

It will be found, we think, that those who have lived the longest and enjoyed life the most have so arranged their periods of labor that the sunshine and shadow will each have had its due proportion.

To accomplish this means an orderly arrangement of professional labor with exercise in the sunshine, if possible, or at least out of doors. One of the most successful of practitioners in the writer's knowledge was one who invariably after a light breakfast started off for a walk of two miles in the parks adjacent to his city. He made this not a mere tramp, without an object, but sought entertainment and mental relaxation in the study of natural objects. A favorite method was to improve the surroundings by introducing rare trees from their foreign habitat and studying them as they developed in their new surroundings. He stocked a pond with goldfish, and it was interesting to watch the crowding of these golden beauties towards the shore as their benefactor walked to the edge, certain as they were of a dainty morsel from his hand. He returned from this exercise invigorated for a day's work, and at five in the afternoon he was off again for a ride or a walk, preferably the latter.

The combination of sunshine and shadow, play and labor, must come into the life of every operator if health is to be maintained. In the writer's opinion there should be a break every day at twelve o'clock, a light lunch, followed by a walk in the noonday sun. The return to work at one will be with body refreshed and the mental forces strengthened.

The invariable response to this is, "I cannot break away; patients are pressing, and it means just so many dollars from my income." Patients should be trained to know that hours of relaxation are not to be infringed upon, and in the end the money gained, if gained at all, is eventually lost in broken health.

The traveller in European lands is surprised to find in many places that the idea here sought to be conveyed has become the settled habit of the people. The work of the world seems to have come to a stand-still at the noon-hour. The money-changer leaves his temple, the merchant the mart of trade, and an intermission of

two hours' rest is taken, feeding the wants of the body and refreshing the mind. Whether this be the true idea or not, it is certainly better than the continued rush adopted in this country, and it is especially desirable that in our profession there should be a change made by the partial adoption of this mode of division of the day's work.

The proper commingling of the dynamic forces of the great luminary with the no less potent change of occupation should bring sunshine and health into every dentist's experience. We cannot measure the molecular forces in the ever-changing human organism,—the tendency here to disease and there to health,—but we can by persistent activity and intelligent observation so regulate our habits that as dentists we can enjoy equally with others a fair measure of health and a minimum of discomfort in the practice of our profession.

THE LAST DAYS PRECEDING THE CONGRESS.

WHEN this number is distributed among our readers the last month preceding that in which the World's Columbian Dental Congress is to convene will have commenced its rapidly-passing weeks.

A wise person will not postpone securing a temporary home at Chicago until the last moment. While the local committee assures us that accommodations are ample and to be procured at reasonable rates, they must be secured in advance. The committee of the Columbia Dental Club have widely advertised the fact that they are prepared to receive applications for rooms. It is hoped that there will be an immediate response to this, and in numbers to warrant the general expectation, long entertained, of the largest dental meeting ever held in this or any other country.

It would seem almost a waste of energy to urge the duty resting upon every dentist to make the sacrifice of money and time to be present. The Congress promises to be the one event in professional life, and with the unequalled attraction of the Exhibition added, it should prove the most powerful educational and social stimulant that dentistry has witnessed or is likely to experience in many generations.

It has been wisely stated in the circular of the Chicago Club that the length of the visit should not be limited to the week of the Congress. The Fair should be largely in the background be-

fore that is entered upon. Hence, a week in advance will give time to satisfy, in some degree, the desire to see the Exhibition, and give a zest for the more serious labor of the meeting. Conventions have always suffered when brought in competition with extraordinary attractions elsewhere, and it will be so in Chicago unless this advice be followed.

The work of the various committees has been mainly completed, and the few short weeks yet remaining will be occupied in closing up minor details.

Let each dentist, whether active in scientific work or in the routine of practice, for once close the office during August and make Chicago his abiding-place for the largest portion of that month. The personal sacrifices made, we feel assured, will in the future mark a period in every dentist's personal history, and one he would not willingly have blotted from memory.

AN EXPLANATION.

IN the July number of this journal for 1890, pages 402 and 403, appears a letter signed "A Patient," and on page 705 of the November number (1890) a communication to the editor by the same person. The second paragraph of the latter would appear to cast the reflection upon the author of the paper, to which the letter is appended in the July number, that he had made an unauthorized use of this letter.

The present editor of the JOURNAL, in a spirit of fairness, permitted the second communication to appear (at the request of the author of both letters), with the belief that further explanation by the parties would bring out the facts. To his surprise, this was not done, so far as this journal is concerned.

The case was, however, brought before the Council of the First District Society of New York, and it was made manifest to that body that the letter published on pages 402 and 403 of 1890, before alluded to, was a genuine one, and that the patient had authorized its use, on condition that his proper name be protected from publicity. These pages would have been open at the time for the statement of the above facts or any others which would have justly protected either of the parties. We can only regret at this late date that the JOURNAL was not given the opportunity to know the facts, and thereby relieve Dr. Kasson C. Gibson from the imputation of want of sincerity in using the letter of his patient.

COLUMBIA DENTAL CLUB OF CHICAGO.

THIS club has been organized for the entertainment of visiting dentists from all parts of the world and to serve as head-quarters for the World's Columbian Dental Congress.

The dentists of Chicago have solved one of the greatest difficulties connected with the Congress, that of having a place where visiting dentists can meet. The stopping-places will be necessarily widely scattered, and it seemed at one time as though the social life of the Congress would be limited to the meetings. This admirable arrangement entirely overcomes this difficulty.

A Bureau of Information has also been established in connection with it, through which convenient rooms may be secured at rates to suit. Address Dr. R. C. Brophy, Manager of the Bureau, 300 Michigan Avenue, Chicago. Those who wish can have their mail directed to this number.

The efforts of the profession in Chicago to make it comfortable for visitors deserve the highest praise, and we have no doubt will be gratefully appreciated by all dentists in attendance.

ALL AMERICAN DENTAL DEGREES REJECTED IN
GREAT BRITAIN.

THE Medical Council of Great Britain has decided that the dental diplomas from Harvard and Michigan Universities shall, hereafter, be refused registration. We will print the full text of the official letter in our next issue.

Bibliography.

A COMPEND OF DENTAL PATHOLOGY AND DENTAL MEDICINE. By George W. Warren, D D.S. Second Edition, Illustrated. Philadelphia: P. Blakiston, Son & Co., 1893.

The fact that a second edition of this Compend has been called for in so short a period since the first issue is an evidence that it has filled a needed place in dental education.

The author has achieved a fair measure of success in condensing important pathological conditions into small paragraphs,—more

so, perhaps, than is usual in this character of books. Nothing so much indicates the growing tendency towards abbreviation and reducing the time given to study as these Compenda. If properly used as aids to more thorough work they have a special value, but if depended on entirely they become misleading.

The criticism can fairly be made against this Compend that it devotes too much space to fractures and dislocations and too little to the every-day pathological conditions.

The portion devoted to *materia medica* is well prepared, and while not as full as it might be made, will be found an excellent hand-book for the student.

Obituary.

DR. FRANKLIN MORRIS DIXON.

Dr. Dixon died June 4, 1893, in the seventy-fifth year of his age.

The most prominent feature in the life of Dr. Dixon was the love he had for his family and his profession and the exceeding care with which every operation, whether of minor or major importance, was performed. He acted in his professional work upon the principle that if it were worth doing at all it was worth doing well. With this as his guiding star, he was recognized by his circle of professional friends as one of the most skilful and artistic gold-foil manipulators in the profession.

Dr. Dixon was born in Petersburg, Huntingdon County, Pennsylvania, April 15, 1819; his parents were James and Ann I. Dixon; he was the sixth of ten children, only two of whom survive him. In 1842, at the age of twenty-three, he entered as a student with Dr. Elisha Neall, of Philadelphia, and after spending one year in the laboratory of this preceptor, learning to carve teeth and swedge plates, he opened his office for the practice of dentistry, which he pursued until the close of his earthly career, June 4, 1893, making the period fifty years of continued practice, most of the time in Philadelphia, though a few years were spent in Pottsville, Pennsylvania. No man had a more loyal patronage. His life and labors are of interest to the present generation of dentists from the fact that he entered the profession at a time when every dentist not only made his own plates, but also manufactured the teeth used in the construction of the denture.

When the writer entered his laboratory, in October, 1851, for the purpose of instruction, the first six months were spent in preparing all the different ingredients used in the manufacture of porcelain teeth—single and block, plain and gum—from the crude material; and in nothing was the character of the subject of this sketch more forcibly manifested than the care with which these materials were selected and ground by hand, with mortar and pestle, and placed in separate jars with fused specimens of the body, and the great variety of blue and yellow enamels, cemented on each, designating the quality and color of contents. The gum color used was made from purple powder of cassius, which itself had to be previously prepared from protochloride of tin and solution of gold, a process which, under his care and instruction, was worked out with most satisfactory results. During over two years of the writer's pupilage, not a block or single tooth—plain, pivot, or gum—was inserted that was not carved in his laboratory with knife in hand,—biscuited, enamelled, and fused in a muffled furnace prepared for the purpose.

Operative dentistry at this period had not made the acquaintance of rubber dam, annealed gold-foil, hand, electric, or automatic mallet, but with napkins, serrated instruments, and hand-pressure, Abbey's and Morgan's soft gold-foil was, in Dr. Dixon's hands, used in performing contour-work as efficiently and as beautifully as any inserted at the present day; not as expeditiously or with the same ease, it is true, but it was accomplished. Never will the writer forget the restoration of an inferior bicuspid which had been destroyed with decay from the labial gum margin, and which, with only napkins to protect the operation from moisture, was in this manner completely contoured. This same indomitable perseverance characterized Dr. Dixon's work as long as he was able to stand by his chair.

Dr. Dixon married, June 1, 1858, Miss Elizabeth Alter, daughter of Solomon Alter, of Philadelphia, a most estimable woman. Four daughters with their mother survive him. Knowing the value of education, every nerve was strained to give his children the most favorable opportunities available.

A generous heart, a free hand, a sanguine temperament, and a restless disposition gave Dr. Dixon many anxious hours, but also endeared to him many friends, who will long remember the enthusiasm and the love he gave his profession.

C. N. P.

Notes and Comments.¹

EDUCATION FOR ITS OWN SAKE.—In a recent editorial in *Harper's Magazine* the beauty of education and culture for its own sake is admirably expressed. The writer says, "If people could get the idea that what is called education is a good thing in itself, without reference to its practical uses, what a long step ahead the world would take! The notion that education must be for some definite purpose is responsible for much misdirected effort and many disappointments. What needs leavening and liberalizing and lifting up intellectually is the great mass of society. We shall get on a solid basis when we recognize the truth that a thorough education, a full development of all the faculties, is worth all it costs to the individual and to his or her associates, if it may never be put to any professional use." The infusion of culture into ordinary affairs in many towns and cities in the West is also alluded to. There is no doubt but this progressive spirit, with its many schemes for diffusing cultivation, is due to the fact that so many of our educated, well-bred young men and women have gone there and established themselves in business. To improve the tone of society, then, is excuse enough for the higher education, as the most important worldly thing is, how to make our lives and society most interesting and helpful.

THE THERAPEUTIC USE OF SYRUP OF CHLORIDE OF IRON (Ved.).—Owing to its destructive action on the enamel of the teeth and liability to disturbance of the stomach, the tincture of iron is objectionable. It may be advantageously replaced by the syrup. In this preparation the excess of acid is neutralized by an alkali, and while still presenting an acid reaction, it does not attack the teeth nor discolor the tongue. When it reaches the stomach it meets the free hydrochloric acid, and becomes therapeutically identical with the tincture. The syrup is more assimilable, and gives rise neither to nausea nor digestive trouble. Dose, one-half ounce, three times a day.—*Times and Register*, from *La Médecine Moderne*.

¹ The assistant editor solicits contributions for this department,—new methods, new remedies and formulas, or any short practical note which may prove of value to the practitioner or student. Address 1506 Arch Street, Philadelphia.

Current News.

WORLD'S COLUMBIAN DENTAL CONGRESS.

CIRCULAR FROM THE GENERAL EXECUTIVE COMMITTEE.

To the Dentists of the United States of America, Canada, Mexico, Central America, and South America, greeting:

The movement to hold a Dental Congress in Chicago, Illinois, August 14-19, 1893, inclusive, received its official status from the joint action of the Southern Dental Association at its meeting in July, 1890, held at Atlanta, Georgia, and the meeting of the American Dental Association, held at Excelsior Springs, Missouri, in August, 1890. The undersigned General Executive Committee was appointed by the two associations to adopt rules and regulations, fix the time for convening the Congress, secure the place for holding the sessions, and make such other preliminary arrangements as it deemed necessary.

The work of appointing committees to promote the success of the Congress is finished, the permanent officers have been chosen, the honorary officers have been appointed in all foreign countries, and the time and place of meeting fixed.

A general invitation has been issued, asking the co-operation of the reputable dentists of the civilized world to meet with the dentists of the United States of America at the time and place fixed, for the presentation of papers, both scientific and practical, covering the entire range of theory and technology. It is believed that the newest investigations, discoveries, and methods in physiology, histology, bacteriology, pathology, oral surgery, chemistry, materia medica, therapeutics, orthodontia, operative dentistry, prosthesis, and deontology will be presented to this Congress in a manner not heretofore attempted in any international gathering of a similar character.

It is with pleasure, therefore, that we appeal to the dentists of America to assist in this great undertaking, which promises so much for the future of dentistry and dental surgery, in placing its practical and humanitarian objects before the public at large. This Congress will be an educator of such vast proportions to the practitioners of dentistry that few can realize the direct benefits which will accrue, not only to those participating, but to those who deny

themselves the opportunity to make history for the generations yet to follow.

The Transactions, when printed, will be a permanent record of scientific development that may well serve as a starting-point in future professional advancement, education, legislation, and prophylaxis.

Nothing will be omitted to provide for the comfort and entertainment of those who lend their presence for the furtherance of the objects of this Congress, and a programme of such literary merit will be presented as shall reflect in the clearest manner the past history and present development of dental science, including also the practical demonstration of every phase of operations known. These demonstrations will be made by those best fitted by native ingenuity, education, and technical skill in bacteriology, histology, pathology, oral surgery, and other more directly practical subjects, such as orthodontia, prosthesis, electricity, and mechanical operations on the teeth, jaws, and associate parts.

The facilities for meetings and clinical demonstrations are ample to accommodate all who are entitled to admission to the Congress. The Memorial Art Palace is situated near the centre of transportation, it is isolated from traffic, and is well lighted and ventilated.

The general head-quarters will be located at 300 Michigan Avenue, within ten minutes' walk of the assembly-rooms. All communications to the Secretary of the General Executive Committee to be sent to this address after July 15.

The profession in America must now assume the responsibility of making this Congress a success on the lines laid out by the General Executive Committee. This can only be accomplished by the immediate response of those who contemplate being present in person, or by contribution, financial or otherwise.

The committee urgently requests an immediate decision from those purposing to attend, in order to facilitate the work of the various departments and reduce to a reasonable certainty the attendance from America.

Contributions of money should be made directly and at once to the Chairman of each State Finance Committee for transmission to the Treasurer, who will issue his receipt for the same. Accompanying this circular are the codified rules and regulations of the Congress and instructions, for the guidance of all.

Read this circular carefully and preserve it for future reference. Adherents of the Congress will address letters of inquiry to the

Secretary of the General Executive Committee, in order to receive an official reply.

Cordially and fraternally yours,

W. W. WALKER, *Chairman of the General Executive Committee*,
67 W. Ninth Street, New York City, New York.

A. O. HUNT, *Secretary of the General Executive Committee*, Iowa
City, Iowa.

L. D. SHEPARD, *President of the Congress*, 330 Dartmouth
Street, Boston, Massachusetts.

A. W. HARLAN, *Secretary-General of the Congress*, 1000 Masonic
Temple, Chicago, Illinois.

JOHN S. MARSHALL, *Treasurer*, Venetian Building, Chicago,
Illinois.

W. J. BARTON, Paris, Texas.

L. D. CARPENTER, Atlanta, Georgia.

J. Y. CRAWFORD, Nashville, Tennessee.

M. W. FOSTER, 9 Franklin Street, Baltimore, Maryland.

H. J. McKELLOPS, 2630 Washington Avenue, St. Louis,
Missouri.

G. W. McELHANEY, Columbus, Georgia.

H. B. NOBLE, New York Avenue, Washington, D. C.

JOHN C. STOREY, Dallas, Texas.

C. S. STOCKTON, Newark, New Jersey.

J. TAFT, 122 West Seventh Street, Cincinnati, Ohio.

Members of the General Executive Committee.

FINANCES.

Desiring that every reputable member of the dental profession shall be identified with the Congress,—

Resolved, That a payment of ten dollars (\$10.00) shall entitle one to the Transactions and to membership, if eligible.

That a payment of twenty dollars (\$20.00) shall entitle one to the Transactions and to membership as above, and to the commemorative medal.

That a payment of thirty dollars (\$30.00) or upward shall have all the advantages of the twenty-dollar (\$20.00) subscription, and also recognition as a contributor to the financial success of the Congress.

That any student presenting a certificate from the dean or secretary of a reputable dental college shall be entitled to student membership, and also to a copy of the Transactions, on the payment of five dollars (\$5.00).

RULES AND REGULATIONS.

All public announcements for the General Executive Committee shall bear the signatures of both the Chairman and the Secretary.

The admission fee to the World's Columbian Dental Congress shall be fixed at ten dollars, to be collected only from residents of the United States.

All papers to be read before the Congress shall be in the hands of the Committee on Printing Transactions not later than July 1, and shall not exceed forty-five minutes in the time of presentation. Said committee shall have full power to accept or reject any paper, to revise or suggest a revision by the authors, and to publish or not in the Transactions the whole or parts of papers read, or abridgments thereof.

The official languages of the Congress shall be English, French, Spanish, and German, and the papers shall be printed in the Transactions in the languages in which they are read.

After a paper has been accepted the committee shall prepare a brief synopsis, to be published in the official languages of the Congress.

The chairman of each committee shall send reports of its progress to the Chairman and Secretary of the General Executive Committee at such frequent intervals as will keep them informed of all the work accomplished.

All circulars issued by any committee must be sent to each member of the General Executive Committee, and they shall be of uniform size,—viz., that of the minute forms issued by the Secretary.

The Dental Congress offers a medal for the best popular paper on Dental Hygiene, for public distribution, to be referred to Committee No. 23, to be called the Committee on Prize Essays.

All matters of business presented at the general sessions of the Congress shall be referred to the General Executive Committee, and must receive the endorsement of the committee before they can be entertained by the President of the Congress.

The management of the World's Congress Auxiliary of the Columbian Exposition have offered suitable accommodations in the Memorial Art Palace, on the lake front, in Chicago, for the sessions of the World's Columbian Dental Congress, August 14, 1893.

INVITATION.

The duties of the Committee on Invitation shall be to invite such scientific persons residing in the United States and foreign countries who are not members of the profession, but who by their

recognized attainments in special departments of science would add interest to the meeting. They shall also have the authority to invite such dentists of high standing and reputation in foreign countries as may be agreed upon by a majority of the committee, and a card from the chairman of said committee to the Chairman of the Committee on Registration shall be deemed evidence of the reputability of the holder thereof to entitle him to membership in the Congress, and they shall also furnish the Committee on Membership with a list of the names and residences of those invited.

MEMBERSHIP.

The duties of the Committee on Membership shall be to pass upon all applications for membership which may be referred to it by the Committee on Registration or the Treasurer.

The membership shall consist of legally-qualified and reputable dentists (as defined in the Code of Ethics of the American and Southern Dental Associations) residing in the United States, and such other scientific persons as may be invited by the Committee on Invitation, each and every member to be entitled to one copy of the Transactions.

All dentists residing in foreign countries who desire to acquire membership in the Congress will file their application with the honorary president or vice-presidents of their respective countries, who are empowered to pass upon their eligibility.

When applications are satisfactory to the honorary president or vice-presidents, or a majority of them, in said country, the names so agreed upon shall be transmitted by July 15, 1893, to the Chairman of the Committee on Registration, who will proceed to issue a membership card without further reference.

OFFICERS OF THE CONGRESS.

Science.—Department A.

Section 1.—Anatomy and Histology.—Chairman, R. R. Andrews, Cambridge, Mass.; Vice-Chairman, E. P. Beadles, Danville, Va.; Secretary, F. T. Breene, Iowa City, Iowa.

Section 2.—Etiology, Pathology, and Bacteriology.—Chairman, G. V. Black, Jacksonville, Ill.; Vice-Chairman, Geo. S. Allan, New York, N. Y.; Secretary, E. S. Chisholm, Tuscaloosa, Ala.

Section 3.—Chemistry and Metallurgy.—Chairman, D. R. Stubblefield, Nashville, Tenn.; Vice-Chairman, J. S. Cassidy, Covington, Ky.; Secretary, E. V. McLeod, New Bedford, Mass.

Section 4.—Therapeutics and Materia Medica.—Chairman, F. J. S. Gorgas, Baltimore, Md.; Vice-Chairman, N. S. Hoff, Ann Arbor, Mich.; Secretary, Geo. E. Hunt, Indianapolis, Ind.

Applied Science.—Department B.

Section 5.—Dental and Oral Surgery.—Chairman, T. W. Brophy, Chicago, Ill.; Vice-Chairman, M. H. Cryer, Philadelphia, Pa.; Secretary, J. F. Griffiths, Salisbury, N.C.

Section 6.—Operative Dentistry.—Chairman, Wm. Jarvie, Brooklyn, N.Y.; Vice-Chairman, Daniel N. McQuillen, Philadelphia, Pa.; Secretary, Henry W. Morgan, Nashville, Tenn.

Section 7.—Prosthesis, Orthodontia.—Chairman, C. L. Goddard, San Francisco, Cal.; Vice-Chairman, T. S. Hacker, Indianapolis, Ind.; Secretary, E. H. Angle, Minneapolis, Minn.

Section 8.—Education, Legislation, Literature.—Chairman, J. J. R. Patrick, Belleville, Ill.; Vice-Chairman, H. L. McKellops, San Francisco, Cal.; Secretary, W. H. Whitslar, Cleveland, Ohio.

CENTRAL DENTAL ASSOCIATION OF NORTHERN NEW JERSEY.

THE Thirteenth Annual Meeting and Banquet of the Association was held Monday evening, February 20, 1893.

The President, Dr. Harvey Iredell, being detained by sickness in his family, Dr. R. M. Sanger presided.

The President delivered the annual address. He considered the present legislation connected with dentistry in the State and the proposed changes. A four-years' course was advocated for colleges, and uniformity in dental laws.

Dr. L. D. Shepard responded to the toast, "The World's Columbian Dental Congress."

He remarked that the Congress is to be not simply a mass-meeting of an immense number of dentists, but will be an occasion of labor for professional progress and for calling out the best scientific thought of the world in dentistry, and for the exemplification of the finest technical work by the most skilful men.

Every man who has a thought of value, a fact which is of interest to his fellow-practitioners, has an opportunity to present that thought or that fact to this Congress.

The following toasts were responded to:

"The State of New York, the Empress of the American Continent," by Dr. William Jarvie.

"The Dental Society of the State of New York," by Dr. William W. Walker.

"The State of Maryland," by Dr. D. Holley Smith.

"The State of Pennsylvania," by Dr. S. H. Guilford.

"What Concentrated Effort did with the Census Authorities," by Dr. J. D. Thomas.

"The State of New Jersey as a Factor in Dental Education," by Dr. J. Hayhurst.

"The New Jersey Dental Society," by Dr. Oscar Adelberg.

Dr. Herbert Potts, an invited guest, concluded the speaking of the evening, after which the regular business was taken up, and reports of officers were considered.

The balloting for officers to serve for the ensuing year resulted in the election of the following:

President.—Dr. R. M. Sanger.

Vice-President.—Dr. Thomas Moore.

Secretary.—Dr. W. L. Fish.

Treasurer.—Dr. Charles A. Meeker.

Executive Committee.—Dr. George Emery Adams, Dr. Oscar Adelberg, Dr. Fred. A. Barlow, Dr. Walter Woolsey, Dr. William E. Linsted.

Dr. J. Hayhurst was elected an honorary member of the Association.

COM.

COLUMBIA DENTAL CLUB, CHICAGO.

THE dentists of Chicago have organized the Columbia Dental Club for the entertainment of dentists visiting Chicago during the continuance of the Exposition. They have rented the entire house at 300 Michigan Avenue (about four squares from the Art Palace on the lake front), and it will be kept open daily for the convenience of dentists.

The Club will be used as head-quarters for the WORLD'S COLUMBIAN DENTAL CONGRESS during the month of August, and perhaps after July 15, 1893.

Dentists who contemplate a visit to Chicago may have their letters addressed in care of the Club. Members of the profession in Michigan, Illinois, Indiana, Wisconsin, Iowa, Missouri, and Kentucky are invited to send pictures, bric-a-brac, and curios to embellish the rooms. Everything of value will be returned to the owners after the Exposition closes.

The profession in Illinois will furnish the Club House, and those who contribute fifteen dollars will be entitled to a full-paid non-assessable membership for the six months.

On behalf of the organizers,

A. W. HARLAN,

Secretary-General World's Columbian Dental Congress.

NEW JERSEY STATE DENTAL SOCIETY.

THE Twenty-fourth Annual Meeting of the New Jersey State Dental Society will be held at the West End Hotel, Asbury Park, July 19, 20, and 21.

Papers of interest will be read and clinics by prominent dentists will be performed.

The S. S. White Company and the Edison Electric Company will make especially large exhibits in engines, motors, and fans. Hotel rates,—the best hotel in the Park,—\$2.50 and \$3.00 per day.

CHARLES A. MEEKER, D.D.S.,
Secretary.

NATIONAL ASSOCIATION OF DENTAL FACULTIES.

THE annual meeting of the National Association of Dental Faculties will be held in the house of the Columbian Dental Club, No. 300 Michigan Avenue, Chicago, beginning on Thursday, August 10, at ten o'clock A.M., and continuing through that and the succeeding day. It is important that all matters of business to come before that meeting be properly prepared beforehand, so that business can go promptly forward. It is to be hoped that all persons interested will give special attention to this request, and that every member be promptly present at the beginning of the meeting, as only the two days will be available for the work.

J. TAFT, FRANK ABBOTT, A. C. HUNT,
Executive Committee.

PENNSYLVANIA STATE DENTAL SOCIETY.

THE Twenty-fifth Annual Meeting of the Pennsylvania State Dental Society will be held at the Mountain House, Cresson, Pa., on Tuesday, July 11, 1893. Convenes at 10 A.M. One-day session.

C. V. KRATZER,
Secretary.

SOUTH CAROLINA STATE DENTAL ASSOCIATION.

THE Twenty-third Annual Meeting of the South Carolina State Dental Association will be held in Columbia, Tuesday, August 8, 1893, continuing four days. All members of the profession are cordially invited to be present.

CHAS. S. PATRICK, *President.*
B. RUTLEDGE, *Recording Secretary.*

THE International Dental Journal.

VOL. XIV.

AUGUST, 1893.

No. 8.

Original Communications.¹

BICHLORIDE OF MERCURY AND CHLORIDE OF ZINC IN THE TREATMENT OF PULPLESS TEETH AND ALVEOLAR ABSCESS.²

BY PROFESSOR FRANK ABBOTT, NEW YORK.

MR. PRESIDENT AND GENTLEMEN OF THE NEW YORK ODONTOLOGICAL SOCIETY,—The subject to which I will ask your attention for a few minutes this evening is, in one sense, old and hackneyed, but one full of interest to every practitioner of dental surgery.

There have been so many methods of treatment, and so many remedies recommended, that it almost seems that time spent in a further consideration of the subject would be thrown away. I hope, however, to not be voted guilty of occupying your time this evening for nothing.

If there are pathological conditions to be found in the human organism of more interest, and those which demand a more careful study and more thorough and scientific treatment, than those connected with the oral cavity, I have yet to become acquainted with them. In the treatment of pulpless teeth the results are, I believe, unique in the practice of medicine. That living and dead tissue can be made to exist in the same organ in the system without

¹ The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

² Read before the New York Odontological Society, May 16, 1893.

presenting to either the patient or the practitioner any special pathological condition, is an achievement in medical and surgical practice of which dentists have a just right to be proud.

It is now some thirty years since it was first believed that a tooth which had been neglected or unfortunate enough in any way to have lost the life of its nourishing organ could be so treated as to become not only useful, but rendered in a condition so nearly physiological as to give the patient no annoyance for many years, perhaps for life.

It will be remembered by the older gentlemen present that the late Dr. Wm. H. Atkinson was the first (at about the time mentioned) to assert that pulpless teeth, with or without abscesses, could be successfully treated and made useful and comfortable organs to the patient forever after. You probably also remember the elaborate and long-continued treatment that he followed and taught. Again, you perhaps remember that the writer took issue with him upon his methods of treatment of these cases as well as upon several other modes of practice. From that time to the present there has been very little difference of special importance published in the methods of treatment except as regards the remedies used, and the manner of applying them. Every practitioner, as far as I know, with few exceptions, possibly still adheres to the practice of more or less continued treatment of pulpless teeth before venturing to fill them. That this is a mistake, fraught with a great amount of uncertainty and trouble to the dentist and long-continued annoyance and expense to the patient, it is my purpose to show you this evening.

A saturated solution of iodine in creosote was, I believe, the first remedy claimed to possess the necessary properties for the successful treatment of either of the varieties of teeth under consideration. This remedy, as many of you probably remember, was a very disagreeable mixture to handle. The patient's breath, the operator's hands, instruments, and in fact everything with which it came in contact, became loaded with its unpleasant odor, which nothing seemed capable of eradicating, and the results obtained with it were, in most cases, anything but satisfactory. Then followed in quick succession carbolic acid and creosote. These were, if anything, less satisfactory in their results than the first. The odor of carbolic acid is not so disagreeable nor so lasting as the first mentioned remedy, but it, like that, failed in what was expected of it. When applied undiluted to animal tissue they are both quite powerful potential cauteries, and undoubtedly antiseptic.

The odor of creosote is less objectionable. Pure beechwood creosote is rather pleasant than otherwise to many persons to both the organs of taste and smell, but as a remedy in the treatment of pulpless teeth it is not all that could be desired. When applied undiluted, like the others, it is a good mild potential cautery, and its antiseptic properties are said to be far superior to that of carbolic acid. Are not all of these remedies, however, soon absorbed, and the original conditions, so to speak, re-established? Admitting, if you please, that by the use of these substances all organisms are destroyed, judging from the results it would seem that something was left intact, which causes either the continuance of the trouble or the beginning of new and troublesome complications. There is, in my judgment, something more to be accomplished in the treatment of pulpless teeth than the death of organisms of decomposition. The result of the putrefactive process—the ptomaines—must be rendered inert, otherwise it is fair to presume that the putrefactive process will continue. 2

It is, I believe, a well-established fact in the minds of most pathologists that any substance, claimed to be a germicide, is much more effective when greatly diluted than in its pure state. This is due, probably, to two facts: first, the diluted remedy is more readily absorbed by the diseased or dead tissue, the parts becoming almost immediately, upon its application, saturated with it, while the pure substance is absorbed very slowly; secondly, in the process of imbibing nourishment the organisms take the diluted remedy because there is no uncontaminated nourishment at hand for them to live upon. Consequently they take this and die rather than die of starvation. Thus it is that a solution of carbolic acid of 1 to 100 is classed as an effective germicide; creosote, 1 to 200, etc. 3

Many remedies have been introduced to the medical profession of more or less value as antiseptics, and with which good results are accomplished, but none of them are considered to-day as equal in destroying germ-life and arresting putrefaction to bichloride of mercury. 4

One special advantage this remedy possesses is its ability to accomplish the results desired in so greatly a diluted state. It is claimed to be a germicide when diluted to 1 to 100,000 parts of water. To use it, however, so weak in the pulp-canals of teeth would probably prove unsatisfactory, in consequence of the presence of more or less liquid in the canals, which would further dilute it and render its action *nil*. Another great advantage in its use lies in its odorless quality. A solution of 1 to 10,000 of water is almost

as tasteless and odorless as the water alone, and still this strength will do all that is desired, and may be used freely in the teeth, with no possible harm to the patient. At the same time it is strong enough, even if it is more or less diluted by the liquid contents of the canals, to do the work desired of it. From the almost positive results in the use of this remedy in the treatment of pulpless teeth, I am led to believe that it not only destroys all organisms, but renders ptomaines, if any are left in pulp-canals, harmless. This, I take it, is the result of a chemical change that takes place when the solution of bichloride and the ptomaines meet, rendering the ptomaines inert. The method practised in the treatment of these cases, where no visible abscess is present opening upon the gum, and to which I wish especially to call your attention, is as follows:

After the contents of the pulp-canals are stirred and all removed that can be with an instrument that plays freely in them, a solution of 1 to 10,000 of bichloride of mercury is thrown into them by means of a small gold-pointed (Farrar) syringe. This stirring and washing is repeated until the operator is satisfied as to the cleanliness of the canals; then, in most cases,—not in all,—a very small bit of cotton is carried to the distal end of the canal and packed tightly, plugging the foramen.

It will be observed that up to this stage of the operation, when everything is ready for the introduction of the filling-material, the canals have not been *drilled out*, nor any attempt made to dry them; the cavity in the crown and the pulp-chamber are dried, but the canals proper have been made aseptic, and the antiseptic is allowed to remain and mix with the filling-material, which is immediately introduced into the canals (unless periostitis is present, when, if it is, a day or two of treatment will usually relieve it).

The filling-material consists of oxychloride of zinc, with one drop of a solution of 1 to 2000 of bichloride of mercury mixed with it. The final operation upon the crown of the tooth is immediately done and finished. The addition of the bichloride solution to the cement is made in order that the effect of its constant presence may be assured. As a precaution, the gum over the tooth is then painted with "antiphlogistine" (concentrated tincture of aconite root and tincture of iodine, equal parts). This mode of treatment has been followed by the writer altogether for some two or three years, and in some cases it was done by him as long ago as seven or eight years. It was the success in the treatment of these cases, and a careful study of the subject, that has resulted in adopting the method altogether.

In many cases, I might say nearly all, when the canals are being filled, the filling-material or the liquid (chloride of zinc) is forced through the foramen, and, coming in contact with the living tissue at the end of the root, produces, through its escharotic action, slight pain, which usually lasts from fifteen minutes to an hour.

Let us consider for a moment what advantages are gained by this over that of the protracted treatment so generally followed.

If a pulp-canal is left open and *treated* occasionally, the gas that generates in the process of putrefaction of the contents of the dental canaliculi must escape into it, as it has no other exit. The canal very soon becomes filled with it, so that both mechanically and chemically it acts upon and irritates the living tissue at the end of the root of the tooth, so that every day sees the case complicated with perhaps pain, perhaps suppuration and discharge of pus through the canal. This condition may, and in many cases does, continue for days, weeks, and sometimes even for months before it seems at all safe to fill it. All this is obviated in the treatment above described, consequently it should commend itself to all dental practitioners.

Should any perisosteal disturbance follow the operation, by again painting the gum once or twice with the above-mentioned remedy it subsides, and the tooth becomes as comfortable as it was before exposure of the pulp. Such trouble, however, seldom occurs, the one painting before the patient leaves the chair usually being all that is required.

The treatment of teeth with abscesses is proceeded with in the same general way as far as cleansing and the use of the bichloride is concerned. After this has been thoroughly done, a solution of twenty grains of chloride of zinc to one ounce of water in ordinary cases (forty to sixty grains in chronic cases) is forced through the canal and abscess until its presence upon the gum is indicated by the characteristic white coagulated albumen. The canals and crown are then filled and finished as before described, except that no cotton is placed in the canal before introducing the oxychloride mixture.

The advantages gained by this mode of treating alveolar abscesses over that so generally practised must be apparent to every practitioner.

The chloride of zinc possesses properties which no other remedy does that I am familiar with, that make it one of the most valuable, if not *the* most valuable, agent known in the treatment of this troublesome disease. It mingles or mixes freely with the liquid

contents of the abscess, does its work (destroys the lining membrane of the sac) with very little pain, and its powerful astringent properties, together with its highly-stimulating effect, serve to almost immediately produce healthy granulations, which in a few days results in closing the cavity at the end of the root and the healing of the opening in the gum.

I am aware of the confidence many practitioners reposed in carbolic acid, creosote, iodoform, and other escharotic and antiseptic agents in the treatment of alveolar abscesses. I used them nearly all for many years, nearly always with unsatisfactory results. The lack of the necessary escharotic properties, due, perhaps, in a great measure to the fact that they became too much diluted upon entering the abscess proper, by mixing with its liquid contents, thus rendering them of little, if any, value as a destroyer of the lining membrane (pyogenic membrane) of the abscess. Consequently, the sac remains to receive the migrating, colorless blood-corpuscles which constitute, after their death and partial decomposition, the pus which is constantly or periodically discharging through the opening in the gum.

The chloride of zinc, on the other hand, even if somewhat diluted, takes hold of this abscess-sac so vigorously that its lining membrane is almost immediately destroyed, and it will in a short time (two or three days) break down, and discharge in the form of pus.

Should the canals be left open after its use, or that of any other remedy, the gas from the putrefactive process going on in the canaliculi will very shortly re-establish the abscess, so that the treatment must be repeated over and over again, each time with varying degrees of success or failure.

Alveolar abscesses differ from those in soft tissue in that there is no repair taking place, even after evacuation. The bony walls being unyielding, and not containing sufficient organic tissue to exert pressure upon the abscess, and thus cause its obliteration, it remains, in most cases, for many years, or until the tooth is removed or an escharotic strong enough to destroy it is forced into it. Antiseptics, consequently, are of little use, except to prepare the parts for the more perfect action of the escharotic.

THE DENTIST AS A PRESCRIBER OF DRUGS.¹

BY EDWARD C. BRIGGS, M.D., D.M.D., BOSTON.

IN casting about for some subject to present to you to-night, to which creditably or otherwise I might add some original thought, it occurred to me that in Dr. Taft's article, published in the *INTERNATIONAL DENTAL JOURNAL* for September, 1892, there was much food for discussion and suggestion. In this article he advocated, first, enlarging the field of the dentist by including with his other treatment the systemic dosing of the patient; second, the use of the homœopathic high-potency method; third, that the practice of medicine according to that method is an exact science.

In regard to the first proposition, it seems to the writer that Dr. Taft is leading us into very dangerous ground, and one that, with the average education of the dentist of to-day, is entirely untenable.

While we all like to feel that dentistry in its broadest and noblest sense is a part of the great art of medicine, and not merely expert jewellers' work, it is allied more closely with the other surgical specialties, as the eye, the ear, or general surgery, and like them displays its medical affinity rather by intelligent co-operation with the family physician than by usurpation of his privileges. Even if the dentist were a full graduate in medicine, as most of us are not, he is scarcely competent to take charge of the constitutional treatment of the patient, if for no other reason than because the constant and full demands upon his time for active surgical treatment at his office prevent him from following up his cases as closely and accurately as necessary if he is to carry out a line of logical systemic treatment. How is it, then, with the dental practitioner who is not a graduate of medicine? Is he by buying and perusing one text-book on the treatment of disease to become competent to practice general medicine? Of what use, then, are medical schools, and why should not every intelligent layman buy a book and dismiss the doctor?

In the Harvard Dental School, where the subject of drugs and their application to disease is gone into to perhaps a fuller extent than in any other dental school, the students are taught that all the collateral instruction is given them, not that they should take up general practice, but that they should have an intelligent

¹ Read before Harvard Odontological Society, March 30, 1893.

knowledge of what auxiliaries they may have in their treatment and when and under what circumstances they can call upon the general practitioner to aid them in producing a cure. To be sure, they are taught, and expected to use, the application of many drugs in the class of cases which might be called emergency cases, as, for instance, the use of cardiac stimulants in case of syncope, whether from nervous fright or the use of anæsthetics; but when it comes to the prescribing of drugs to be taken by the patient at his house, away from the care of the dentist, it seems to me we should stop to consider carefully what it means.

The dentist at present occupies an enviable position, in that he is free from the trammels put upon the followers of the different paths or schools in medicine. He treats all alike, whether his patient is a Christian scientist, a believer in mind cure, a high-dilution homœopath, a broad homœopath, an eclectic, an allopath, or a "regular." He has the satisfaction of doing positive helpful work for his patients and seeing that it is good, but Heaven help him if he has to reach out after his patients in their homes, and build this one up with prayer, the next with mental balm, the next with the one-thousandth potency, and perhaps have another who is only satisfied when he has taken the largest dose possible, and escape toxic symptoms.

Do we want to encourage patients to come to us because we are practising in one of these various schools? Taking our patients as they come, have we any more right to dawdle them along with the one-thousandth potency of silica than to salivate them with mercury, especially when we can cure them by the positivism of surgery?

Nor does the course which the writer of this paper advocates preclude a wide and vast knowledge of drugs and other remedies and their relation to disease. On the contrary, he should be able to recognize when his patient needs help outside of his, the dentist's, local treatment, and, by intelligently calling the physician's attention to the need of the case, procure for the patient what is required. Let us be thankful that the patient decides by his choice of a physician whether hypnotism or a course of iron will best suit his case. Suffice for us to know that statistics show that as many get well under one ism as another.

We have, as it is, a grand field for work and helpfulness to our patients, conflicting with no school or ism,—our surgical operations, our topical remedies (which even the Christian scientist does not cavil at), the laws of hygiene and diet, to which all schools of medicine have to bow. Given the fullest knowledge of hygiene and

diet, which has not yet been attained by any one, all physic can be thrown to the dogs, even the one-thousandth potency, and we can have that grandest of all spectacles, a physician who cures without drugs.

In regard to Dr. Taft's proposition that medicine is an exact science, the writer ventures to contradict it flatly.

Medicine as practised by any school is not an exact science.

The Hahnemannian law, which is a law founded upon the supposed relation of a drug to a disease, and therefore considered by many an irrational, illogical law, since as such there can be no relation, is really founded on the rule of drugs themselves, which is, that small medicinal doses have a contrary physiological effect to full toxic doses, and therefore a small dose will often antagonize pathological conditions which resemble the symptoms produced by the toxic dose; but this rule, like all others, has its exceptions, and woe betide the physician who lashes himself irrevocably to the spar of that belief.

All these different creeds are steps, and only steps, towards a perfection of healing which is still a long way off.

Lest in my antagonism to some of the principles of Dr. Taft's paper I should seem to be decrying homœopathy, let me pay it this tribute,—it has helped medical practitioners as a whole towards that rational and wise doctrine that obtains to-day, that generally a smaller dose of medicine, often repeated, is better than a larger one at greater intervals, and that we should seek to get our effects with the smallest dose possible. Even this, however, would have come, and did come in many instances, by the rational deductions from the experiences of able men not students of homœopathy, and homœopathy must not claim too much for itself, or it will be in the ridiculous position of a political party which claims all the prosperity of a growing, fruitful country, full of natural resources, to be due to its own wise administrations.

The art of healing with drugs is bound to develop, whether hindered or helped by different isms; but ancient as it is, so long a-growing, it is nevertheless true to-day that surgery stands head and shoulders above it, and we as dental surgeons must remember that when we pause in our surgery to give drugs we are rather looking backward and taking much needful time better devoted to positive surgical operation.

Now, this cutting off of the dentist from the systemic treatment of his patient with drugs still leaves him a field in the study of remedies larger than any one of us will ever be able to cover to

his satisfaction. Take the topical remedies which he is called upon to use, what a list they comprise! and what a knowledge of chemistry he ought to have to know when and why he should use them! The principles which underlie his use of them, the possibilities and probabilities of absorption into the system, their antagonists, synergists, and compatibilities.

And, lastly, hygiene and diet. Here, indeed, is meat for strong men. Here is a legitimate field for us, and herein are possibilities which as yet we have not even guessed at. In food preparations we have remedies which are not drugs, and remedies which, if rightly applied, will do more to make our work perfect and keep it so than the use of drugs by any system can do.

In studying food values we can learn how best to supply the phosphates to be used in formation of the teeth, and thus in early life construct teeth that will resist decay; we can regulate the diet to prevent the fermentative processes which make the mucous membrane a hot-bed for germs. We may find out how to so feed our patients as to prevent the inflammatory conditions which result in pyorrhœa alveolaris and kindred complaints; we may supply through the food the various elements of the gastric juice, which may be deficient; we can see to it that oxygen is supplied for the proper oxidation of food ingested, and that children in puberty are not physically destroyed in the attempt to force their brains.

Dentistry is a specialty of medicine, not of a particular medical school, and the dentist of the future will have need for all that the best medical schools can teach him, and a great deal more, and yet be able to practise free from the trammels of any particular doctrine.

A FEW THOUGHTS ON THE COMBINATION OF FILLING-MATERIALS.¹

BY DR. BENJAMIN LORD, NEW YORK.

MR. PRESIDENT AND MEMBERS,—A great deal has been said and written, from time to time, on the subject of combining in some way different filling-materials.

The idea, or the practice, is not exactly new, but more has been said about it of late than formerly; and, as all are aware, the sub-

¹ Read before the New York Odontological Society, May 16, 1893.

ject has been discussed not a little before this Society in the last few years.

There has been less said about the combination of foils than about the combining of amalgam and gold, and the use of oxyphosphate with gold, and also with amalgam. For some reason which I do not claim to understand, we find that when amalgam is put by the side of gold, in cases where decay has extended beyond the gold filling, it does better; that it changes less in the way of shrinkage, and that the edges or margins are maintained much more perfectly than when amalgam only is used.

I have not tried the packing of gold and amalgam together, and so cannot speak from experience about it; but I should apprehend a good deal of embarrassment and risk in the attempt to pack gold by the side of, or into, a soft material. I have felt that in cavities in which, for any reason, I wished to use gold and amalgam in combination, a much better practice would be to make the gold filling first,—not being particular to pack the gold solid at that point or part of the cavity where I propose to put amalgam,—and then, after condensing and finishing the surface and margins, to remove the gold from that part of the cavity intended for the amalgam, and to pack the latter by the side of the gold. The effect of this would be the same as the packing of amalgam by the side of gold to arrest further decay, as before alluded to. I believe that such a method of combining the two materials will be found highly satisfactory.

The combining of alloy filings with oxyphosphate I find in my practice to be very useful. The filling lasts longer and the color is better.

My belief is, I may say, that the use of oxyphosphate in the starting or retaining of gold fillings, as recommended by some, could not be a certain or reliable practice, for very good and logical reasons.

A combination in which I find great interest is in the use of soft or non-cohesive gold with tin-foil. This is no novelty in practice; but I think that, for the most part, too great a proportion of tin has been used, and hence has arisen the objection that the tin dissolved in some mouths. I am satisfied that I myself, until recently, employed more tin than was well. I now use from one-tenth to one-twelfth as much tin as gold, and no disintegration or dissolving away of the tin ever occurs. I fold the two metals together, in the usual way of folding gold to form strips, the tin being placed inside the gold. The addition of the tin makes the gold tougher, so that

it works more like tin-foil. The packing can be done with more ease and certainty; the filling, with the same effort, will be harder; and the edges or margins are stronger and more perfect.

The two metals should be thoroughly incorporated by manipulation. Then, after a time, there will be more or less of an amalgamation. By using about a sixteenth of tin, the color of the gold is so neutralized that the filling is far less conspicuous than when it is all gold; and I very often use such a proportion of tin in cavities on the labial surfaces of the front teeth.

If too much tin is employed in such cases, there will be some discoloration of the surface of the fillings; but in the proportion that I have named, no discoloration occurs, and the surface of the filling will be an improvement on gold in color.

There is another combination in which I find great interest and advantage. It is the using of non-cohesive and cohesive gold, by folding the two together in the proportion of one-third cohesive to two-thirds non-cohesive. I first fold the non-cohesive once, then lay it on the strip of cohesive gold, and fold the two together; the folding thus secures the cohesive always on the outside.

Gold prepared in this way should be used as soft gold, and works almost exactly like soft or non-cohesive gold in those qualities in which soft gold is superior to cohesive; but it is tougher, packs more readily, makes a more solid filling, and gives stronger and better margins.

AMALGAM AS A FILLING-MATERIAL.¹

BY EDWARD PAGE, M.D., D.M.D., CHARLESTOWN, MASS.

MR. PRESIDENT AND MEMBERS OF THE SOCIETY,—To go into the subject thoroughly in relation to its history, manufacture, and use would take more time than I or you would desire to give to it, therefore I must be very brief; but I presume I shall say enough to excite a reasonable amount of discussion; if not, then I shall consider this paper somewhat of a failure.

I have used various dental alloys during the last thirty years, and have been a manufacturer for seven years. Twenty-five years ago I used gold almost exclusively for filling teeth. Since then I

¹ Read before the Massachusetts Dental Society at its annual meeting, June 8, 1893.

have gradually used more amalgam, cement, and gutta percha, and less gold, until at the present time I am using only about one-third as much gold as I did years ago in the same number of operations. I use amalgam because I know it is the best material for the case in hand, and not because some one has dogmatically said it was good or bad without giving any facts or reason for the opinion.

The first record of its use in this country was in the year 1833, sixty years ago. Up to the year 1850 the amalgam used was unsatisfactory on account of a lack of experience in its manufacture and use, and the best results were not always accomplished. In 1855, Dr. Elisha Townsend recommended an alloy composed of four parts silver and five parts tin. This, or a similar kind, has been in use to the present time. All good dental alloys are composed more or less of the following metals: silver, tin, copper, gold, platinum, and zinc. Some alloys contain silver and tin only, others silver, tin, and copper, still another kind silver, tin, copper, gold, platinum, and zinc. Thus an almost endless variety can be made from these six metals by using two or more kinds in different proportions. Silver is the most important metal used in making dental alloy. In fact, without silver, dental amalgam would be nearly valueless. The general average of its use is more than any other metal except tin. It is essential for making a hard setting amalgam and for maintaining the integrity of its structure. Tin is second in importance in making dental alloys. It has no chemical affinity for mercury, but it is a medium of solid vehicle in which the silver molecules are mixed mechanically and appropriately for amalgam purposes. Copper is frequently used, from one to ten per cent., generally about five per cent. It increases plasticity and makes a harder amalgam, but slightly increases shrinkage, and may cause an inflow of the fluids of the mouth between the surfaces of the fillings adjacent to the walls of the cavity. Consequently this space is filled with a black sulphide of silver and copper discoloration, which hardens the dentine and wonderfully preserves the tooth substance. On this account some dentists claim that an alloy that shrinks is the best, and I think it appears to be reasonable.

Gold is not commonly used in dental alloys. It does not increase edge strength, hardness, or toughness. The only benefit is a slight increased plasticity and quick setting, and it makes a smoother filling; consequently it controls shrinkage. Zinc would produce a similar result in a much smaller quantity, with the exception of decreasing the plasticity instead of slightly increasing it, as does gold, and also retard black discoloration, as gold does not. There-

fore zinc is more valuable than gold. It is a very useful metal on several accounts. It controls shrinkage, is quick setting, and hinders black discolorations. Twenty out of the fifty-four alloys on the market contain zinc.

Platinum is of no benefit to amalgam; it increases brittleness in alloys and renders them liable to crumble in proportion to the amount used. It may in a small degree produce quick setting, consequently prevents shrinkage, but this could be accomplished by using zinc or gold, without the injurious effects of platinum.

A great many reasons have been given why fresh-cut alloy is the best, but if all alloys are mixed according to the following rules, it will make but little difference whether fresh cut, coarse, or fine. Use a Wedgwood mortar instead of by the hand. Prepare a teaspoonful of hydrochloric acid to a pint of water. Keep this in a large bottle; pour a sufficient quantity into the mortar, add the alloy, stir with a pestle, add the mercury, amalgamate; then wash in plain water; dry out the moisture as much as desired before using.

By this method the acid will cleanse the black oxide from each particle of alloy. Amalgam treated in this way will set quicker and stronger, because there is not so much discoloration to interfere with the chemical affinity between the silver and mercury, also with less tendency to discoloration because of the decreased amount left in the amalgam mass. Therefore silver and copper, but principally silver, is the cause of the discoloration on amalgam fillings. Although silver has but little affinity for oxygen it unites with the allied element, sulphur, more readily than any other metal. The tarnish on amalgam filling is caused by the formation of a thin film of sulphide from the traces of sulphur compounds usually present in the air. Matches carried in the same pocket with silver coin will illustrate this point. Consequently the alloy that contains the smallest amount of silver and copper and the largest amount of tin, zinc, and gold will make the lightest-colored fillings.

A great many dentists object to using mercury enough to make an amalgam plastic, for the reason that in pressing out the surplus a large percentage of the metals will be carried with it. This has no real foundation in fact, as experiments have proved that only one five-thousandth of one per cent. of gold, and the same amount of silver, and only a trace of platinum, too small for estimation, is pressed out of a mix of dental amalgam containing four hundred and eighty grains. This is so small that there can be no objection to using all the mercury required to make a mix sufficiently plastic.

No history of dental amalgam would be complete without reference to the amalgam war which commenced in this country in the year 1840, and was carried on within the ranks of the dental profession. The opposition to the use of amalgam had no scientific basis, as nearly all who opposed it had, in the language of one noted opponent, "never touched the nasty stuff." The opposition to its use did not realize that it would be well to prove all things and hold fast to that which is good. In this case, like all others, the agitation of thought proved to be the beginning of wisdom. The same opposition was active when vulcanite rubber was introduced into the profession as a base for artificial dentures, and like amalgam has won its way to popular favor by its intrinsic value. A ten years' warfare was waged against its use, the most bitter and unreasonable that has ever disturbed the harmony of the dental profession, and practically ended in 1850, so far as any dental society's authority or jurisdiction was concerned, by the adoption of the following resolution: "*Resolved*, That the several resolutions adopted by the American Society of Dental Surgeons at the annual meetings held in 1845 and 1846, having the effect of enforcing subscription to the protest and pledge against the use of amalgam and mineral paste for filling teeth, be and the same are hereby rescinded and repealed." Since then its merits have gradually become appreciated, until, as a rule, dentists, including nearly all the best operators, use it when in their opinion its use is indicated.

A tooth is like a sick person, it should receive such treatment as would be best for that particular case. Gold is sometimes the best material to use and sometimes it is the poorest, and so of amalgam, cement, and gutta-percha; discrimination in filling-materials is of the utmost importance in the treatment of diseased teeth. Not long since a dentist, who is not a member of this Society, but has an office in a prominent street on the Back Bay, said to me, "I use nothing but gold in filling teeth." In the light of the present day, educationally and conscientiously considered, what a statement! Can such a man be honest and intelligent? I have my opinion, you are at liberty to have yours.

The question, What shall we use for filling teeth? is not new, but is as important as ever. One noted dentist said, several years ago, "In proportion as a tooth needs saving, gold is the poorest material we can use." This statement I believe to be correct, and I have practised in accordance with it for a number of years.

Amalgam is unique as a filling-material. Large crown cavities in molars can be partially filled with cement or gutta-percha, and

finished with amalgam, or it can be used in filling cavities difficult of access. It is also very useful where the cavity goes below the gum on the buccal or approximal surfaces of molars. The cavity can be partially filled with amalgam and finished with gold. Likewise large crown cavities where it would be unsafe to fill with gold or alloy.

Dr. Clapp, a member of this Society, has given clinics before several societies to illustrate his method of combination fillings. Fill the bottom of the cavity with cement, cover this with alloy, then finish with Steurer's gold. Thus we have the benefit of three filling-materials. The cement is a poor conductor of heat and cold, and keeps the tooth comfortable. The alloy is easily packed over the cement. The cavity is then finished with gold before the alloy hardens, and thereby it is firmly attached to the alloy. Thus a satisfactory appearing filling is produced with all the good qualities of each material, and is of more real value than could be made with either alone.

Dead teeth, or teeth badly decayed, can be filled or built on with amalgam so as to make them useful for years. Amalgam in such cases is almost indispensable, and as one dentist has said, and I think truthfully, "a good amalgam filling is better than a poor gold filling." A few well-meaning people really believe that amalgam fillings are dangerous, notwithstanding amalgam as a filling-material has been used for sixty years in this country and by millions of people with no serious results so far as any scientific proof is concerned. In the first place, we cannot reason a person out of that which they have never been reasoned into. Therefore they that have accepted a dogma in relation to medical practice cannot be very easily reasoned out of it. A few persons, principally on the Back Bay, who practice homœopathy appear to take the responsibility to dictate to the profession of dentistry what shall be used as a filling-material. This profession stands second to no other in relation to education, scientific investigation, and painstaking research into the causes of disease. Who are the persons who object to amalgam? Are they our scientists, men who have made a study of nature's laws, those who are familiar with the microscope, chemical and quantitative analysis? As a rule, I think not, but are those who have accepted some one's dogmatical say so, and are like the Scotchman, who said, "I am open to conviction, but where is the man who can convince me?" I desire to approach this subject of amalgam in an impartial spirit, without fear or prejudice, as I am a student seeking for truth in every department of life.

I know very well that there are and always have been a few who have objected to its use for filling teeth. Now, if there is any serious or valid reason why we should not use it, I would be glad to know it, not believe it, but have scientific evidence given supported by facts so abundant that there could be no reasonable doubt about it; then I for one would not make or use it in my practice. A patient once said to me, "I suppose gold is the best filling for teeth." I replied, "Sometimes it is, and sometimes it is the poorest." If we could have but one kind, either gold or amalgam, for filling teeth, I would say, abolish gold and retain amalgam as the best. I would say about gold as a filling-material as Dr. Holmes said about medicine, if all the gold were thrown into the sea it would be better for the people and perhaps worse for the fishes.

I know of dentists who say they use more gold in filling teeth than accords with their judgment because their patients demand it. Men may theorize as much as they please, but every case is settled by an extensive practical demonstration. Dr. Lardner, a scientist, gave a lecture in Boston many years ago to prove theoretically that it would be impossible for a steamer to cross the Atlantic. At the same time a steamer was crossing and arrived safe and sound in due time. Scientific theories without practical proof have thus many times come to naught, and so with those regarding amalgam.

A few physicians say amalgam in teeth is unsafe and an obstacle in the way of curing disease, when it has been used more or less for sixty years in every civilized country with no difficulty, and has been found to be no obstacle in the treatment of disease.

Some dentists have noticed an irritation on the mucous membrane opposite an amalgam filling. It seems plain that this inflammation could be produced by jagged edges of the filling. Dr. Foster Flagg says he has frequent complaints of this kind, and cases have been sent to him to illustrate the evil effects of amalgam fillings, and he has invariably cured the patients without removing the fillings. The difficulty is a lack of thoroughness. Because the filling is an amalgam do not fail to do the best work, prepare the cavity as perfectly as for a gold filling, see that your alloy is well amalgamated, avoid all slovenly work, leave no mass of the material overhanging the cavity at the cervical margin to irritate the soft tissues, or neglect to polish the filling when hard. If there is faithfulness in these particulars a good filling will be the result, and no cause of complaint will be made of irritated parts near an amal-

gam filling. Success in all callings and all operations depends on thoroughness. Success or failure is due to the operator more than the material. There is no trouble in finding amalgam fillings that have done good service for twenty or thirty years, showing that amalgam has virtues that no other material possesses. Dr. Bonwill, who has had a wide experience with filling-materials, said a year or two ago, "I am filling more teeth with amalgam than ever before." From what I can learn I think this is true of the profession throughout the country. When a physician looks into a patient's mouth and says, "That is bad," the patient asks, "What is bad?" and the doctor replies, "Amalgam fillings in your teeth," I would say that such indiscriminate and wholesale statements are wrong and have no foundation in fact, and are as unscientific and unprofessional as the statement made by a doctor in his experience with yellow fever, to the effect that a certain remedy he had used would cure a Frenchman but would kill a Scotchman.

Perhaps there may be rare cases where a person would be unpleasantly affected by an amalgam filling in the teeth, but so rare that scarcely a case would be found in an ordinary dental or medical practice of forty years. If this be so, is it worthy of our attention, or can it have any bearing on our regular practice? In all cases where the physician should advise the removal of amalgam fillings on account of being harmful the diagnosis ought to be doubted at once, and a consultation called for, with a demand for the scientific reasons for such diagnosis. If dentists would insist upon this course we would soon hear but little more in regard to the bad effects of amalgam fillings.

I recently called upon a homœopathic physician in Boston who is noted for his opposition to this material. He did not wish to make a written statement or give any reasons for his dislike of amalgam fillings, but stated in a general way that he had cases where he failed to effect a cure on account of amalgam fillings in the patient's teeth, and when these were removed or the teeth extracted the disease was cured without any serious difficulty. He mentioned one case where he treated a young lady for an inflammation in the mouth unsuccessfully. He noticed, as he said, a stub built up with amalgam stuff, and ordered the tooth extracted, after which he found no difficulty in curing the lesion. He cited this to prove that amalgam fillings were harmful.

To my mind this is a very simple case. Probably no more so than nearly or quite all those reported as to the bad effects of amalgam fillings, and can be explained thus: the diagnosis was incorrect.

Evidently the tooth was dead. The swelling was a fistula caused by an abscess, or, if the tooth was not devitalized, may have been caused by a jagged edge of the filling overhanging the cavity. In either case if the tooth were extracted the inflamed surface would get well without any treatment whatever. I also had an interview lately with another homœopathic physician of large practice. He said in all this time he had not seen a case where he thought amalgam fillings were in any way harmful, and that he looked upon certain physicians on the Back Bay who object to amalgam as cranks, and I believe from what I learn that this view is entertained by almost all medical practitioners from every school of medical practice. Therefore we should insist that no amalgam fillings shall be removed or teeth extracted by the order or advice of any physician without professional consultation with the patient's dentist, and then only by mutual consent.

Dr. S. B. Palmer, of Syracuse, N. Y., who has had a large experience with amalgam, says, "I have no facts or proof that leads me to think amalgam as a filling is injurious. I know of cases where all amalgam fillings have been removed without benefit, and the physician who advised it being done felt the reaction through the disappointed patient."

A society of scientific gentlemen in Europe a number of years ago tested vulcanite rubber in saliva under all degrees of heat likely to exist in the mouth to discover if mercury could be detected in this fluid, but no evidence of it could be found. In the language of Professor Mayer, I would say, "I doubt as to whether we can speak of any physiological action of amalgam beyond the very small border line of dentine into which the products of oxidation and sulphurization penetrate. That a small amount of mercury may be dissolved from amalgam, not through the dental tubuli, but from their surfaces, aided by the process of mastication, seems entirely reasonable and probable, but the quantity is so small that it cannot be well ascertained by weight in the laboratory."

A great many persons who have been more or less affected with disease have been told that their amalgam fillings must be taken out before a cure could be accomplished. The fillings were not taken out, and they got well with no unusual delay or unlooked-for difficulty. I will mention one case of many. A young lady called on a dentist of my acquaintance and a member of this Society and requested him to remove all her amalgam fillings, as her mouth was in a diseased condition. A noted homœopathic physician had urged that this be done. She was advised to consult another doctor, and

did so. He made no objection to amalgam, and treated her, with complete recovery in two weeks, without having her fillings removed.

The following case came under the observation of a dentist who is a member of this Society. A lady under treatment by a very prominent homœopathic physician was also a patient of this dentist, who, knowing that her physician would not be in favor of amalgam, filled her teeth with cement and gutta-percha. Her medical treatment did her no good, and after a while she went to New York and other places, during which time she was under the treatment of her physician. While she was away she had her cement and gutta-percha fillings replaced with amalgam. Soon after she began to improve in health until she apparently was in good condition. Now, it would be just as logical to say that homœopathic remedies would do no good until the patient had her teeth filled with amalgam as it is that disease cannot be cured until amalgam fillings are taken out. Such cases only show how easily one could jump to a conclusion without any scientific reason, and dogmatically decide a question without a thought.

A lady wished to have an amalgam filling removed, as it made her sick. The dentist made use of a little Yankee wit, which might be considered questionable. He said to her, "I will replace this amalgam filling with one of silver," and did so, and she had no more trouble with it.

Early in life Sir Humphry Davy assisted Dr. Beddoes in his experiments on the inhalation of nitrous oxide. Dr. Beddoes having inferred that the oxide must be a specific for palsy, a patient was selected for trial and placed under the care of Davy.

Previously to administering the gas, Davy inserted a small thermometer under the tongue of the patient to ascertain the temperature. The paralytic man, wholly ignorant of the process to which he was to submit, but deeply impressed by Dr. Beddoes with the certainty of its success, no sooner felt the thermometer behind his teeth than he concluded the talisman was in operation, and in a burst of enthusiasm declared that he already experienced the effects of its benign influence throughout his whole body.

The opportunity was too tempting to be lost. Davy did nothing more, but desired his patient to return on the following day. The same ceremony was repeated, the same result followed, and at the end of a fortnight he was dismissed cured, no remedy of any kind, except the thermometer, having been used.

One person cannot eat cheese, another cannot comfortably stay in a room with an apple, coffee, honey, or a cat.

Queen Anne would faint at the sight of a rose. In order to test this case, an artificial rose was shown her and she fainted just the same, which proves that as a man thinketh so he is.

This condition is the peculiar idiosyncrasy of some individuals. When a person is under the control of a dogma in relation to medical practice or anything else, science, reason, or facts will have but little effect to change his mind, but education in all its branches will do it in time, however slow.

This is also true in regard to amalgam. What is the sensible and scientific practice relating to the cure of disease? It is to use any remedy that will help the patient. This certainly is reasonable. Any substance or law is open to us all to use as a remedy for the sick. If a few doctors find their remedies incompatible with amalgam in the teeth, so much the worse for their remedies, and they should be given up as unworthy the name.

I do not blame the few medical practitioners for their opposition to amalgam fillings, as they evidently do so for conscience' sake. I should do the same if I were satisfied that amalgam as a filling-material was harmful, but because a person is honest that is no proof that he is wise. It is not sufficient that a doctor be honest. He ought also to be intelligent. Either alone would lead to trouble. If both go together, we may expect the best results.

Therefore to object to amalgam in order to have the opinion respected, there must be given an honest and intelligent reason.

We who use amalgam are satisfied that it is useful and harmless. Therefore let those few persons who object to it on any ground give us and the world some good plain scientific reasons to prove it unfit to use in our practice, but for the few to denounce it as incompatible with a healthy condition of the mouth is absurd, and unworthy the notice of our profession. The demand of our time is, What do you know? instead of How much do you believe?

Now, in conclusion, let us all be reasonable. If there is any one who can show cause why amalgam should not be used as a filling material, let us calmly listen to substantial proof and scientific demonstration; but if no such reasons can be given, then, in view of these facts, let us continue to use it when its use is indicated by our judgment.

TO MAKE JOINTS TIGHT WITH AMALGAM.

BY DR. W. S. SIMONTON, CAMERON, W. VA.

IN amalgam fillings the union of the amalgam and cavity walls must be close and tight to make a reliable filling. The line of contact must be such that the secretions of the mouth, or any substance whatever, cannot pass between the walls of the cavity and the body of the filling. In fact, this result must be obtained with whatever material may be used for the filling. Generally amalgam does not form so good a joint, if this term may be used, nor maintain it so well, as some other materials; and here, I think, is one of the causes for the many failures of amalgam fillings. No standard amalgam, properly manipulated, is porous, and if any substance enters a cavity filled with it and causes decay, it must do so through the joint or line of contact of the material and tooth substance. Hence this perfect union must be obtained and preserved if good results are to be secured with amalgam fillings. In teeth of good structure, and a crown cavity not too large, these results are secured by filling in the ordinary way. In teeth soft and friable, and in approximal cavities, it is especially hard to maintain, and the tooth will soon be found decaying along the line of contact of metal with cavity walls. Fillings of this kind are always, or almost always, failures; hence the importance of obtaining and maintaining this perfect junction between the two substances. There is an old mechanical resort of introducing a third and different body between two other bodies to assist in joining them, as gum packing in steam- or water-joints or glue between two pieces of wood.

In amalgam fillings, having prepared the cavity, wash it with alcohol and disinfect, and, having prepared the amalgam by triturating with alcohol in a small mortar, prepare some thin cement,—just how thin I know of no way of stating, but will refer again to this. Having the cement prepared, with the rubber dam on, line the edges of the cavity with the thin cement by taking a small quantity on a thin, narrow instrument, and scraping it off on the edges of the cavity entirely around the outer edge, so that the cement will hang over in the cavity. Then introduce the amalgam as nearly as possible into the centre and work from this point, and press it out against the walls of the cavity. Press it with force sufficient to carry it to the walls. This will leave an open space in the centre of the incomplete filling, into which insert more amalgam, pressing it in with considerable power, so that it will back up and

join with the amalgam already pressed out against the walls. It will readily be seen that the cement must be so thin that it can be forced away, allowing the amalgam to approach the walls. After filling the cavity and pressing and condensing thoroughly, remove the surplus, and the filling will generally be found hard enough to take a good finish. The work of filling and pressing to the walls must be done quickly, as the cement will very soon commence to harden and not allow the amalgam to join the walls, leaving small portions that will soon wear away and produce a leak or expose a small space to decay. This is not mixing cement and amalgam to form a filling-material, but is using the cement to secure a close or impervious union or joining of the two different substances. The cement is, of course, not entirely pressed out; a small portion becomes mixed with the amalgam at the border and glues it to the walls of the cavity, so as to cause it to adhere very closely; yet the portion of cement remaining, if the operation be properly performed, is so divided up by the amalgam and protected by it that it cannot wear or wash away, but still performs its part by maintaining the integrity of the line of contact.

This is the best method of making amalgam fillings I have ever tested, especially, as I stated previously, if the filling be large or approximal. It is particularly serviceable in the teeth of the young,—much more so if it is desirable to make a filling that will wear longer than cement. I began this method five years ago, and filled the teeth of young persons where I would otherwise have used cement, and find the filling good at the present time. I was performing some work for a young woman for whom, when a child, I had filled a first lower molar by this method. She had called to have the tooth extracted, as it was badly decayed and broken down, crown almost gone, there being far more of the filling left than the tooth crown. When I examined it, the filling was in good order, no decay about the edges, they being well joined up and preserving the tooth, or what there was of it, two-thirds of the crown being built up of amalgam.

Amalgam is generally decried as a filling-material, yet it is one of the sheet-anchors in preserving teeth, and does this better than gold or any other filling-material, perhaps more than all others together. Yet there are occasions when it fails from want of care on the part of the operator. Amalgam fillings should be as well and as carefully made as when other material is used. This method will often help out of a difficult place, and will under nearly all circumstances give better results. To the dentist who will not stoop

to amalgam, and uses nothing but gold, it will be of no value; but to others, who cannot fill every cavity that is presented with gold, or who are willing to save a tooth even with amalgam, it may help.

DIAPHATHERIN IN DENTAL PRACTICE.¹

BY JOHN BERGER, D.D.S., GÖRLITZ, GERMANY.

SOME months ago a new antiseptic was discovered by Lembach and Schleicher, of Bieberich on the Rhine, and with regard to its chemical compounds is called oxyquinaseptol or diaphtherin. It represents a light-yellow powder of slight carbolic odor, soluble in water to a certain extent. Its formula is $\text{HO} - \text{C}_6\text{H}_6\text{NH} - \text{O} - \text{SO}_2 - \text{C}_6\text{H}_4 - \text{O} - \text{NHC}_6\text{H}_5 - \text{OH}$. It is a combination of oxyquinolin and aseptol. In higher temperatures it is reduced and oxyquinolin and carbolic acid become free.

Professor Emmerich was the first to publish experiments in regard to its antiseptic properties, according to which diaphtherin has a higher character than carbolic acid and lysol. A 3 to 1000 solution of diaphtherin was able to kill the staphylococcus pyogenes aureus in a quarter of an hour, while a 5 to 1000 solution of carbolic acid or lysol had no such effect in an equal period. A 1 to 1000 solution of diaphtherin was sufficient to destroy the Koch's bacilli of Asiatic cholera in about ten minutes; an equally strong solution of lysol could not destroy them in a period of three-quarters of an hour. The bacilli of diphtheria and some other pathogenic bacteria were destroyed by a solution of 2 to 1000 in ten minutes.

Clinical experiments with this remedy were made by Dr. Kronacher, who used diaphtherin in his surgical clinic in extirpation of carcinoma mammæ, epithelioma, and other tumors, various abscesses, drainages, fistulæ, etc. It always gave excellent results, and did not affect the hands of the operator similarly to carbolic acid. He never discovered any infection of the wounds, and claimed it as an excellent antiseptic without caustic properties. Nevertheless, it penetrates the tissue and disinfects not only the surface of

¹ Read at the annual meeting of the Society of the Alumni, Department of Dentistry, University of Pennsylvania, May 9, 1893, by Dr. W. E. Christensen, Philadelphia.

the wound, but also its deeper layers. Any injurious effect on the organism is absolutely excluded.

In this way diaphtherin is one of the best antiseptics ever introduced, and it did not take long before it was used in dental practice. It has been a need in dentistry to have an antiseptic that would be strong enough to destroy micro-organisms in decayed teeth without discoloring properties or other injurious effects upon the tissue. Carbolic acid is not strong enough to penetrate perfectly-curved root-canals which could not be drilled and filled perfectly to the foramen apicale. Corrosive sublimate is valuable for this, but it discolors the tooth-substance, and therefore never should be used, at least not in the front teeth. Iodoform, according to Dr. Miller, of Berlin, and others, is limited as an antiseptic, and has a very disagreeable odor, to many persons almost insupportable. Diaphtherin is a very strong antiseptic, with but a very faint odor, not unlike that of carbolic acid, and has no corrosive properties and does not discolor the tooth-substance. Dr. Hamecher, of Plauen, was the first who tried it in dental practice, and he found it to be of exceedingly great value in the treatment of root-canals. In one experiment he imperfectly removed the *débris* of a putrescent pulp, and then filled the whole pulp-chamber with a thick paste of diaphtherin and water, and inserted the filling without any disagreeable reaction following.

Even in cases where pericementitis had taken place without forming a fistula, he had most satisfactory results in filling them at the first visit of the patient. He always used diaphtherin in a solution of 1 to 100 in the treatment of fistulæ, empyemas, antri Highmori, various extractions, etc. When applied it generally causes a burning sensation, but the patient has no subsequent suffering from any changes of the mucous membrane of the mouth.

Some time ago I began using diaphtherin in my own dental practice, and I have found it to be an antiseptic to which no other preparation is equal. I will describe a few cases in which I used it.

I. Patient, lady of about twenty-six; second molar tooth. After application of arsenous acid twenty-four hours, on removing the portio coronalis of the pulp it was followed by a very disagreeable bleeding. The canals were narrow and curved. I filled the pulp-chamber with a paste made of diaphtherin and oil of cloves, and closed the cavity with cement. The tooth gave no further after-trouble.

II. Patient, lady of about thirty; bicuspid tooth with inflamed pulp and slightly inflamed pericementum. After having removed the pulp and cleaned the canals, I filled the roots at once with a

mixture of diaphtherin and carbolic acid, and closed the cavity with cement. The tooth became comfortable immediately, and has so remained. Several other cases similar to these, in incisors, cuspids, and bicuspid, have all given most excellent results. In one only can I report a failure: patient, young man of about nineteen; upper first molar with chronic pericementitis. At the request of the patient I filled this tooth at once, though I recommended extraction. After cleaning out the root-canals, I filled them with diaphtherin and oil of cloves, and closed the cavity with cement. Two days after I was forced to extract the tooth, when I found the roots curved and the palatine one filled with strong-smelling pus. This tooth, of course, would have needed a very different treatment.

But in spite of this it will be seen that diaphtherin is an antiseptic superior to any one we have had so far, and I should recommend every dentist to try it. It is, however, to be remembered that it attacks steel instruments rapidly on account of the oxyquinolin, wherefore it should be used only with strongly nickel-plated instruments. I have a small spoon, like a spoon-shaped excavator, to introduce it into the cavity. For filling root-canals I take a small piece of platinum wire retained in an ivory handle.

SOME OF THE RIGHTS AND DUTIES OF DENTISTS AT COMMON LAW.

BY BABSON S. LADD, BOSTON.

As preliminary to the view that I am to attempt to present some of the rights and duties of dentists at common law, I shall venture to remind you that in all employments demanding special skill and knowledge, be such employments classed as professional or mechanical, the general principles of law defining the civil responsibility and duties of persons thus employed, are the same. Taking, then, for illustration the list put by Dr. Elwell in his work on medical jurisprudence, it may be said that physicians, lawyers, engineers, machinists, ship-builders, and brokers, as well as all other classes of men whose employment is of the character I have indicated, are bound by the same general rules of law.

The law requires a dentist in his conduct towards his patient to exercise that reasonable degree of skill, coupled with learning

and experience, which is ordinarily possessed by others of the dental profession.

States regulating the practice of dentistry simply operate to exclude from practice those persons (quacks and charlatans the courts have called them) who are incapable, from lack of the learning and experience ordinarily possessed by dental practitioners, of treating their patients with a reasonable degree of skill. All of this is for the protection of the public. That is common law.

Any one who assumes to be qualified for the exercise of any profession, art, or vocation is responsible for any damage that may result to those who employ him from the want of the necessary and proper knowledge, skill, and science which such profession demands.

He impliedly contracts with those who employ him that he has such skill and knowledge as will enable him properly to perform the duties of his calling. If he should be deficient in these respects, he violates his part of the contract, and must account in damages for any malpractice by which those who employ him sustain injury.

The failure of a course of treatment is not by any means conclusive of that want of professional skill by the practitioner. If his acts have been in accordance with the best known authority and skill, even though they should have been wrong, he will, in the eyes of the law, have done all that he could have done.

The standard of professional skill is never stationary. It must be kept up to and even with the constant advance of professional knowledge. Therefore the law demands *qualification* in the profession practised; not extraordinary skill such as belongs to only a few men of rare genius and endowments, but that degree which ordinarily characterizes the profession.

In keeping up with the march of the profession it is well to advance cautiously in experimental practice, for if the experiment in any particular case is rash and contrary to knowledge and usage of the profession, you will be liable for malpractice, as it matters not in such cases what your general skill may be.

Some standard by which to determine the propriety of treatment must be adopted, otherwise experiment will take the place of skill, and the restless experimenter the place of the educated, experienced practitioner. When, therefore, the treatment or operation is experimental, the practitioner will act at his peril, unless he first obtains the consent of the patient or some one in authority acting for the patient. In the wrongful act of a student or ser-

vant, the preceptor or employer would be wholly responsible for the evil results which might follow if performed while in his employment, the law holding that the omission is the omission of the principal. In regard to the claims of dentists for professional services, the law recognizes the difference in the value of time. In the absence of any agreement as to the amount to be paid for services rendered, the law recognizes an implied promise to pay so much as the dentist deserves to have, which amount will be governed by the scale of prices in general use among dentists of good standing.

On the other hand, he cannot exact compensation for services necessitated by his own lack of skill and care.

The patient, however, is not without some responsibility, and must faithfully comply with professional order or advice. Nothing can be clearer than the duty of the patient to co-operate.

In giving evidence in court the expert cannot be compelled to testify, and the only way to procure his testimony is to pay for it, the obligation to pay resting upon the party who calls the expert.

Reports of Society Meetings.

NEW YORK ODONTOLOGICAL SOCIETY.

A REGULAR meeting of the New York Odontological Society was held on Tuesday evening, May 16, 1893, at the New York Academy of Medicine, No. 17 West Forty-third Street, New York City. Dr. Woodward, the President, being absent, the chair was occupied by Dr. Brockway.

The minutes of the previous meeting were read and approved.

INCIDENTS OF PRACTICE AND COMMUNICATIONS.

Dr. Benjamin Lord read a short paper on the subject of combination fillings.

(For Dr. Lord's paper, see page 570.)

Dr. Davenport.—For some time I have intended saying a few words about the combination of gold with zinc phosphate, but forgot it until it was brought to my mind this evening. We remember with pleasure that Dr. Clapp, of Boston, gave us a little talk some

time ago, and emphasized by a beautiful exhibition of specimens his different methods. I do not intend to contradict what Dr. Clapp said, for he has proved that in his hands the combination of gold and zinc phosphate, as well as the other combinations, is successful, but I do think the method should be used with extreme care. It was only a few days after that meeting that I had occasion to examine the teeth of two sisters who had but a few months before been discharged "cured" by their dentist, he having made many large gold fillings for them. Considerable pain of an undefined character coming to the young ladies, they went back several times, and being told that nothing could possibly be the matter, had at last been sent to me with the hope that I could discover the cause of the trouble. Several large gold fillings showed by the color about them that something was wrong, and as a test I decided to remove one of them. Drilling through the gold, the burr suddenly entered what appeared to be a deep open cavity, and a little later, cutting out more of the gold, I found that there was a base of zinc phosphate, which had evidently been packed very hurriedly, and, as it seemed to me, with the idea of placing gold upon and into it before the cement had hardened. These large cavities had been filled, most of them, in that way, and almost without exception were giving trouble. I thought at the time Dr. Clapp was telling us about his method that, in my hands at least, the proper placing of the varying zinc phosphates which are furnished us would be exceedingly doubtful if I were to pack gold into it before it had fully hardened, as, of course, must be done if the adhesion of the two materials is to be obtained.

Dr. Howe.—I would like to ask Dr. Lord whether, in referring to the proportions of tin and gold, he means them to be considered by weight?

Dr. Lord.—No, not by weight, but by the width of the strip of tin and the width of the strip of gold. I get the proportions in that way, then lay the tin on the gold and fold the gold over and over, which keeps the tin inside the gold.

Dr. Howe.—Will Dr. Lord tell us whether he refers to the same numbers of gold-foil and tin-foil, as, for instance, No. 4 gold and No. 4 tin?

Dr. Lord.—I use No. 5 gold, and tin, I think, of about the same number; but I always use No. 5 gold, both cohesive and non-cohesive.

Dr. Howe.—Mr. President, I have a suggestion to make in the line of practice. I will begin by recalling to your minds the fact that some years ago it was advocated by some to use pepsin in

some form in the pulp-canals of pulpless teeth to digest devitalized tissue. The idea seemed to be a good one, for there is often material there which, if it could be chemically changed by some digestive process, would be more easily removed. Recently the necessity of removing partly disintegrated pulp-tissue from canals that were rather difficult of access recalled that former practice to my mind, and also the fact that a vegetable digestive has recently been presented to the medical profession called Papoid, made by Johnson & Johnson. I have used papoid in the pulp-cavities of teeth a few times with what appeared to be favorable results. I speak of it merely as a suggestion, that it may be experimented with; I do not intend to make an endorsement of it. I remember distinctly how many things we have known that were grand successes for a brief time.

Dr. Ives.—I think Dr. Howe has struck a good idea. I have had some experience with papoid. Its great characteristic is that it acts equally well with an acid or alkaline condition of the secretion, unlike pepsin. Pepsin wears out; this does not. I believe this is quite a broad idea, and one worthy to be thought of, for just that condition of things would sometimes exist in canals that might be affected by the use of papoid.

Dr. Sailer.—Has the action of this papoid a tendency to destroy the sensitiveness of the pulp when it is in such a condition that we cannot touch it without causing severe pain to the patient?

Dr. Howe.—I cannot answer that question. I do not suppose any portion of pulp-tissue in which vitality lingered would be digested, but I should think that digestion and removal of the devitalized portion would assist materially the subsequent effort to devitalize the remaining part.

Dr. Perry.—I want to say a word in answer to Dr. Lord, not exactly in defence of Dr. Clapp, because I do not think he needs to be defended, but I think he may be misunderstood. Doubtless, as Dr. Davenport believes, there is some risk in the use of the oxyphosphate as a base for the gold, but there is some good in it, if carefully used, remembering always to use the crystal gold, as stated by Dr. Clapp. Perhaps that distinction has not always been made. I can easily see that other forms of gold could not succeed. I have many times started my fillings with a small portion of oxyphosphate in the bottom of the cavity, but I would never depend on the oxyphosphate for holding the gold in after it was placed. It would be only a momentary help for me in getting the filling started. In reference to the filling that was exhibited by Dr. Clapp and dis-

placed by the thumb-nail, it must be remembered that Dr. Clapp stated that he had never put a filling in the mouth in that way. He has since sent me the same tooth refilled, and the filling seems very secure.

In reference to the use of the amalgam in the bottom of the cavity, Dr. Lord stated that he had not tried it; that he hardly thought it would be possible to combine the two, using the gold with and against the soft material. If the matrix is tied tightly around the tooth, so it does not yield to any great extent, and the amalgam is packed in the lower third, the excess of mercury taken off so that the amalgam in a few moments becomes practically hard, and then crystal gold used, I think it will be successful. I have heard several gentlemen say that they have not succeeded in the operation, and, upon being questioned, they stated that they had not used crystal gold. You cannot expect to succeed with foil, but with crystal or Steurer's gold it is an easy matter. I anneal the first pieces thoroughly, so they will take away all the excess of mercury, and then I reject those pieces of gold; then put on the pieces of crystal gold, hold them in place, and work them into the filling, having the matrix tied tightly by that beautiful method shown by Dr. Clapp, of tying it with thread or silk, and adapting it to the contour of the tooth; then the gold can be packed carefully until the undercuts are reached, so as to steady it, after which you can proceed rapidly. I have performed that operation very often since Dr. Clapp described it, and I have watched for an opportunity to say a word about it here before the Society. I am sure there is some good in it.

In reference to Dr. Lord's suggestion of packing the amalgam at the cervical wall after the gold has been packed, I think it a very good one. I have done that when I found defects in my filling after taking off the matrix. I sometimes pack soft gold in large masses at the cervical wall, expecting to make a condensation, and to add more gold along that border after the matrix is removed, and have had what I consider most excellent results, and I think Dr. Lord's suggestion of the use of amalgam in that way is most valuable, and will help many persons. I would not try to get an absolutely perfect margin in some cases at first, but I would take off the matrix and then do the best I could afterwards, either with gold or amalgam.

Dr. Niles, of Boston.—One can hardly help but agree with what Dr. Perry has said in regard to the packing of amalgam and gold together in certain cases. I have experimented with the

process a little, and I find that we must be cautious as to the amalgam used, especially in cervical cavities. We all know that we possess but little information in regard to the manufacture of our amalgams as to the combination of metals used; while our fillings may be well placed and our work done perfectly, if the amalgam does not stay where it is placed, the filling will soon become worthless, no matter how nicely it has been executed. I have found a number of fillings recently where the amalgam bulged out very badly at the necks of the teeth and decay had begun; it was necessary to remove a number of fillings that had been so made by a very skilled dentist in our city. I also saw others in the same mouth doing well. Whether two different makes of amalgam had been used or not I do not know. The chief benefit of this process is, I believe, in that it expedites filling. The method which I adopted very early in practice, and which may be new to some of you, is to keep my gold cylinders exposed freely to the air some length of time before they are used. I find it changes the nature of the gold very much indeed, and it is my custom to keep my cylinders which I use first in packing in the cavity exposed to the air for at least three weeks or a month. They become very soft and tough, and in my method of packing, which I can do just as quickly as with amalgam, after the cavity is two-thirds filled, I use my cohesive gold for filling. It is done very quickly; and where the cavity is of comparatively easy access, there is no advantage in using amalgam. All of my amalgam is prepared from a formula arranged some time ago, so I know what to expect of it. It is good amalgam, and seems to stay where I put it, and yet I have not sufficient confidence to use it soft underneath the gold, unless in extreme necessity from certain conditions which I wish to overcome at the cervical margin.

Dr. Littig.—I should like the Secretary to read a resolution, which I want to offer to the Society, and which they can take action upon or not, as they wish.

WHEREAS, The very high tariff duties on dental goods have for years been a serious hindrance to the dentists of this country in obtaining instruments and materials from abroad, and

WHEREAS, The last two tariff laws considerably increased the duties, and have effectually prevented the importation of many foreign products,¹ the privilege of using which would be a decided benefit to us and to our patients; therefore be it

¹ Some of which cannot be manufactured in this country.

Resolved, That we believe it to be desirable and expedient for the dentists throughout the United States to petition Congress to materially reduce the duties on all foreign dental goods. We believe that every dental society in the country would gladly unite in endorsing a general petition to this effect.

The Dental Protective Association of the United States has already rendered extraordinary service to all dentists, and through the self-denying labors of its chairman, Dr. J. N. Crouse, is still working to relieve us of onerous burdens.

As this Association is organized for such work, it seems appropriate that the effort to obtain a reduction of tariff duties should be made through this the largest and most influential dental organization in the country; therefore be it further

Resolved, That we request of Dr. Crouse that this work be undertaken by the Dental Protective Association, and that the Corresponding Secretary of this Society forward to Dr. Crouse a copy of these resolutions, making known to him the desire of this Society that he communicate to us his decision after due consideration.

Dr. Littig.—I should like free discussion on this subject, because I should not want it to go before the public without some endorsement which would be equal to the emergency.

Dr. Perry.—I think it is worthy of the notice of any society. The object of a dental society is to disseminate knowledge and benefit the dental profession at large. I move the adoption of the resolutions.

Dr. Bogue.—I do not like, under these circumstances, on the spur of the moment to suggest amendments in a paper that has evidently been prepared with a great deal of care, but Dr. Littig practically gives me permission to intimate that one point at least has not been noticed here that might have some bearing on the subject. It should be mentioned that some of the materials are not and cannot be manufactured in this country.

Dr. Littig.—I certainly will accept that amendment, as it is a very good one.

Dr. Bogue.—It is well known to the gentlemen present that the dental dealers took a great deal of trouble to see that that tariff was enacted, and no doubt they would fight this. It seems to me very becoming in this Society to take the initiative to bring a matter of this kind before the whole profession. I would like to suggest that Dr. Littig look over the first few lines and see whether that suggestion could not even be made a little stronger than I have stated.

Dr. Bishop.—I would suggest that this resolution be referred to Dr. Littig to report at the next meeting, with a list of the articles that we are paying more for by the increase of duties. I would like to know what they are.

Dr. Littig.—Everything we use that comes from the other side has been increased since the last tariff from ten to fifteen per cent. The reason my attention was called to it was that the teeth were introduced as porcelain products, and there was a dispute in reference to it. I was called upon to go before the commissioners and testify as to what the teeth were composed of. After giving my statement and having an analysis made of the teeth, they were introduced coming to this country as feldspar productions, which reduced the tariff on the English teeth. Now they are five per cent. more than they were before the passage of the McKinley bill. It is based upon a different thing altogether. It is based upon the cost of the article, instead of the *ad valorem* as it formerly was. It makes a difference in the amount of almost everything we get from abroad.

The Chairman.—The idea that Dr. Bogue has suggested has been added by the Secretary, and if he will kindly read it, I should like to know the pleasure of the gentlemen present in regard to it.

The Secretary then read the resolution as amended.

Dr. Perry.—Dr. Bogue said very justly that doubtless the interest of the dealers was enlisted to increase the duties. Their interest will be to keep those duties to the highest possible rate. How can we protect ourselves if not in this organized way?

Dr. Sailer.—The only point that presents itself to my mind is whether the resolutions are strong enough, and if it would not be better to refer it to a committee to report at our next meeting. It will be the starting-point of a great movement, and the starting-point should be as strong as possible.

Dr. Perry.—It seems to me that if this Society take the initiative in this way it would be sufficient. It will take proper course as it proceeds. The season is waning, and I have heard that there will be a revision of the tariff. A month lost may be of some importance. The question could be settled this evening.

Dr. Howe.—This is a resolution merely requesting the Dental Protective Association of the United States to undertake this work. If they undertake it, it will be their function to decide upon the way of doing it. The object of the resolution is that we, the New York Odontological Society, ask Dr. Crouse to undertake to obtain the petitions and get them presented to Congress. If we ask him now, we may get an answer before our next meeting. If for any reason he should see fit to decline, it would then be our province to discuss it further.

Dr. Perry.—Our next meeting is the last one of the season. It

seems to me a great deal could be done during the summer, particularly in view of the Columbian celebration.

Motion carried.

Professor Frank Abbott then read the paper of the evening, entitled, "Bichloride of Mercury and Chloride of Zinc in the Treatment of Pulpless Teeth and Alveolar Abscess."

(For Dr. Abbott's paper, see page 561.)

DISCUSSION.

Dr. Abbott.—In view of some of the discussions which have taken place in reference to the disposition of dead or partially dead pulps in the roots of teeth, it is perhaps well for me to make the statement that I refer in this paper to nothing except absolutely dead and disintegrated pulp-tissue.

Dr. Howe.—It will be remembered by many here that Dr. C. T. Stockwell, of Springfield, has been an advocate of immediate root-filling, and on that point I wrote to him recently, asking him to come and discuss this question. He was unable to come, but he wrote me the following:

"The paper which I contributed to the discussion of this subject by the New York State Society in May, 1887, and published in the Transactions of the Society for that year, gives in sufficient detail not only the method of treatment I had then practised for several years but my present method also. Thus my experience for more than eight years does not, as far as I am personally concerned, suggest any radical change. The method has come to be known as that of immediate root-filling. This word 'immediate,' however, needs to be taken with a grain or two of allowance. Dr. Abbott does not, as I understand, fill roots with any material as the first step in the operation. He rather treats with bichloride of mercury in order to obtain certain conditions, after which he fills with oxychloride of zinc. So in my method I use H_2O_2 and bichloride of mercury in water until I secure certain conditions. When these conditions are gained I proceed to fill the roots with gutta-percha, moistened liberally with a solution of iodoform and eucalyptol (Sander & Sons' preparation). The same results would be had, I presume, if oxychloride of zinc or chloro-percha were used. The requisite condition to be gained before filling is, of course, 'the elimination of putrescible matter and the destruction of septic agents,' as was stated in the paper referred to, and my experience convinces me that this condition can be secured at one sitting in the great majority of cases. I may here say that I do not often fill at the first sitting

cases that present soreness caused by pericemental inflammation. In regular practice there is seldom occasion for haste, and to be doubly sure is the safest course. It is exceedingly rare, however, that results by experimental fillings do not indicate that a permanent filling might not as well and as safely have been made. Of course there are a large number of cases where, for various reasons, it is difficult, to say the least, to gain ready access to the extreme apex of the canals of roots. This is often the case with the molars. In this class of teeth I have sometimes resorted to treatment with a strong solution of nitrate of silver, and then filled as best I could. So far my experimenting with this agent, barring the objectionable discoloring of the tooth, is all that could be desired. I have just sent a brief note relative to this matter to the *INTERNATIONAL DENTAL JOURNAL*, which, I presume, will appear in the June number. I have also, in a few cases, used Dr. Schreier's preparation of potassium and sodium, and so far am much pleased with the results. It may be said I get the same results practically that is had when the nitrate of silver is used, minus the discoloration of the teeth. I have yet to have my first case where the least indication of soreness or pericemental inflammation has followed when either of these two agents has been used, and the roots filled at the same sitting. Thorough work must, however, be done. One must know the condition he seeks to gain, and be able to recognize it when gained, else how can success be hoped for? Pure empiricism here, as elsewhere, will fall into deep pits more or less often."

Dr. Perry.—These two gentlemen must have a great deal of faith and hope, or they have struck a far-reaching and scientific fact. I have sometimes followed this treatment in the manner that has been spoken of, but always with great fear of causing trouble, and never to the extent of filling up more than the extreme apex of the root, leaving the subsequent operation of filling the canal and pulp-chamber to be performed some days after the test has been determined. I should not have the courage to go that far. I am much pleased to hear from both of these gentlemen in this way. It is certainly encouraging to us to find that they consider this treatment safe. It will be a great advantage to be able to control those teeth in that way, without the long treatment which we have used heretofore.

Dr. Bogue.—Neither the essayist nor the letter read tells us whether the cases under consideration are those which are ordinarily known as blind abscess,—that is, pericemental irritation,—or whether they are actually open abscesses, and it seems to me that

it makes a vast difference. Dr. Hurd, whom every one remembers, got up one evening in Brooklyn, when a gentleman had been talking about what had happened in his practice, and said, "Mr. President, the gentleman has a great deal to say about 'my patients.' Mr. President, the gentleman forgets that the 'critters have legs, and they use 'em.'"

Two of those who have been most prominent as advocates of immediate root-filling are persons with whose practices I happen to be much interested and rather familiar. I do not refer to any one in New York. "That the critters have legs, and they use 'em," I do know, for I have seen many of them after treatment who refused to return to their operator, and as the result of the effort to treat what we know as blind abscess by immediate root-filling, I have seen cases so bad that I felt sympathy for both patient and operator.

I rise, therefore, to beg our essayist to make as distinctly as he is willing his position clear before us as to what he means, or *if* he means to apply his particular course of treatment to the roots of teeth having open abscesses only; I shall be very glad to hear of his admirable success. I can readily believe that he has had just that success. Can I accept his figures the same as I accept those of Dr. Cunningham, of England, who used Fowler's solution of arsenic. He had, according to his tables exhibited in Paris, but two or three failures, and all the rest were successes. If we are to undertake to syringe out a canal closed at the upper end, it seems to me there will be regurgitation, and if we undertake to inject remedies, and then fill, relying upon the syringing, what is the basis on which that treatment is to succeed? At present I do not quite understand.

Dr. Abbott.—I do not like to accuse Dr. Bogue of being asleep when anything interesting is being discussed, but I am afraid I must do so in this case. I do not recognize any such condition as what is termed "blind abscess," for no such thing exists. There is periosteal inflammation or irritation, but when we have an abscess pus is present, and there can be nothing blind about it. Now for the next point. In the first place, Dr. Stockwell says one wants to understand the condition that he has to deal with, and the nature and effect of the remedies that he uses. Then it is fair to presume that his treatment will be successful. This covers the ground. I have for twenty-five years treated abscesses in no other way than immediately to fill the roots after properly cleansing. I have never treated a tooth in my life and left it open to take care

of itself, unless periosteal irritation was present. It will be remembered that twenty-five years ago I took issue with our late friend Dr. Atkinson upon this point, claiming that it was unnecessary to treat teeth in that way, and that it really prolonged the trouble.

Dr. Perry.—Does not everybody do that,—treat an abscess and fill the tooth at once?

Dr. Abbott.—Dr. Atkinson treated some cases for six months. He taught this method to every one he could, far and wide; and I presume—in fact, I know—that very many practitioners follow his methods in treating teeth *without* an abscess; and where there is no pericemental irritation, you will discover that, upon being opened, there is sometimes a very bad odor that penetrates everything. There is no abscess, however. If you disturb the living tissue at the end of the root, and leave it open, so that putrefying material can come in contact with it, or admit the air, it will, in combination with the heat and moisture already present, cause trouble. Suppose you destroy every organism in a pulp-canal and leave ptomaines behind, putrefaction will almost surely recur. These ptomaines are washed out or rendered inert by the bichloride of mercury. The bichloride of mercury seems to have the effect of destroying and getting rid of all putrefactive substances. To show you how much confidence I have in this work myself, I will say that, some four years ago, I had a tooth in my own mouth—an upper molar—which had been dallied with more or less until its pulp had died. One day I broke the side of it off. I went to a dentist, who is not present to-night, I am sorry to say, and he opened the tooth, and said, “Why, the pulp is dead.” He opened the pulp-chamber and the canals. He could seemingly go to the very end of each of them. I do not think he used bichloride of mercury in the treatment of the case, but he washed them out with a syringe as best he could. He filled them under my directions, and put on the crown of amalgam. That tooth is in my head now, as sound as possible, and never gave me any trouble, except for an hour or two after the operation. He forced the material through one or two of the small roots, and the sensation, of course, was very unpleasant. That shows you the confidence I had myself at that time in this manner of treating these cases. There was no subsequent periosteal trouble. This work I do every day; sometimes I fill two or three roots of different teeth in the same mouth in one day. I have yet to find a case which was not successful, excepting where there has been an abscess previously; then there seems to be at the root of the tooth a condition which means inflammation, more or less severe, for a few days.

But that is the only kind of case that I have any trouble with. If you will follow the directions explicitly as given in the paper, I will guarantee that in nine cases out of ten you will have no difficulty.

Dr. Perry.—Do you make any attempt to dry out the canal with hot air?

Dr. Abbott.—No; I have the antiseptic in the canal, and I want it there. In dressing a wound, no surgeon would think of removing the antiseptic he has used in washing it before he put his dressing on. In order to intensify the antiseptic action I put bichloride of mercury, 1 to 2000, in the filling-material. I do not use the chloride of zinc alone, of course, in cases where there is no abscess.

Dr. Bogue.—Suppose a patient comes in with what he calls a sore tooth. On drilling into the tooth, you discover a dead pulp. What then?

Dr. Abbott.—I cleanse the canals thoroughly, then wash them out with bichloride of mercury, 1 to 10,000, put a bit of cotton in the cavity of the tooth to prevent food from getting in, and then paint the gum with the solution I mentioned in the paper, and dismiss the case for a day or two.

Dr. Howe.—I always like confidence that is the result of intelligent conviction. Dr. Abbott believes that, after a root is filled, there will be no occasion to remove the filling. I have for years filled roots with oxychloride of zinc, and believe that it is the best root-filling I know of; but sometimes I hear it said that it is wrong to fill the root of a tooth in such a manner that you cannot remove the material, as if it were to be expected that you would have to take the filling out. I think that is very rarely the case, and even in the few instances in my practice in which I have undertaken to, and finally succeeded in removing the filling in the root, I have found it a useless procedure. I think the way to succeed in filling roots of teeth is to do it when satisfactory conditions have been obtained. I think that the idea that controls a person who feels that he must put the filling in a root so it can be taken out is very likely to cause an imperfection in the work. I much prefer to proceed with the idea that when I fill a root I mean to have it stay there.

Dr. Perry.—I cannot agree with Dr. Howe. I do not see why a canal cannot be as well filled with the expectation of taking the filling out as otherwise. I think a little bit of oxychloride of zinc on one of those broaches which I described at the last meeting, with a piece of silk at the end of it to close the apex, and the rest of the canal filled either with oxychloride or chloro-percha, with a

little gold point or wire put into it, and that little gold point so made that you can pull it out easily, is just as good as any filling that can be made, and you have the advantage of being able to take it out if you should need to. I will not admit that the expectation of some day removing the filling will lead one to make a poorer one.

Dr. Niles.—There is one condition that would make me careful about filling a dead tooth promptly, and that is where the process has gone so far that the foramen has become enlarged, or when there are bare, exposed portions of the cementum uncovered by death of the peridental membrane. During the past year I have found this condition of alveolar abscess rather frequently. The last case was an inferior sixth-year molar. A young medical student came to me, saying that he had a fungous growth on the side of his gum that he had been burning out with caustic. It could at once be seen that it was a fistula from an alveolar abscess. I opened into the tooth thoroughly, treated it antiseptically, and sealed it up temporarily, leaving it so it could be removed, as it seemed to be a specially aggravated case. In a few days I saw it, and the conditions were about the same as they were when he first came to me. I opened and cleansed it, used antiseptics, and treated it for some days, each time drying and sealing it, but I did not succeed in causing the fistula to heal. I finally said to the young man, "I fear that you will have to lose the tooth." He became impatient with the treatment, and requested that I extract it, with a possible prospect of replacing it, but I found both of the roots of the tooth denuded of the peridental membrane at least one-third of the length. Not only this, but it had become roughened by absorption, resembling an absorbed deciduous tooth. In cases of this kind, I know of no treatment that will heal the fistula. There is exposed foreign substance to which the tissues will not heal kindly, and will always be a source of irritation. I do not see how we can anticipate the conditions of any root. The young man referred to told me the fistula had been of six months' standing. I could hardly credit that the tooth was living six months previous. Yet he assured me that such was the case. It was the most rapid absorption that I had ever seen.

Dr. Ives.—I want to ask Dr. Abbott what is the difference in the escharotic effect between carbolic acid and chloride of zinc. I have always used carbolic acid for a fistula, and I do not think I ever had to make the application twice.

Dr. Abbott.—Carbolic acid, according to my experience, becomes

very much diluted with the liquids in the tooth and abscess. I object to carbolic acid on general principles, as I do to anything that is so disagreeable to have in the office. I am particularly sensitive myself in that direction, and I try in every way to keep rid of everything that has a disagreeable odor, so I use materials that will answer the purpose as well and are not so unpleasant. Chromic acid and other preparations have been used, but they will not do the work so kindly as the chloride of zinc. I think that will be admitted by everybody who has studied the subject. Using it as a weak solution around the roots of teeth, as an astringent, or a highly stimulating substance, it will do more work and do it better than any remedy I ever saw. You will say there is no occasion to use it if you cleanse your teeth thoroughly. This I admit. Dr. Niles has said that it was impossible to look at the roots of teeth when they are in the jaw. That is very true. We judge of the conditions, however, from the appearance of the abscess. An ordinary abscess can be treated and cured as easily as a wound in any other part of the body.

Dr. Davenport.—We usually notice in reading the endorsements of patent medicines that the different writers of such letters live in some out-of-the-way place where we cannot get at them. It has been much the same in the past regarding the advocates of immediate root-filling, for, with the exception of Dr. Stockwell and perhaps one or two other gentlemen who are well known, those advocates have not been readily accessible nor have they been men of scientific attainments. Feeling under great obligations to Dr. Abbott, I wish to thank him for his courage in giving us this result of his practice. We all know Dr. Abbott's position in the profession and in educational matters, and he would not jeopardize his reputation by advocating any extreme method, as this certainly is, without first having thoroughly proved it. For that reason I have great confidence in it, and feel that it is worthy of especial attention and study by us all.

Dr. Bogue.—Does Dr. Abbott make a difference in the treatment of upper and lower teeth?

Dr. Abbott.—None at all.

Dr. Bogue.—Upper teeth and lower incisors Dr. Perry has treated in the way described for many years. So have we all, probably; but lower back teeth most of us have been afraid to treat by that method. Even when an abscess existed, a fistula on a lower molar, it has presented conditions quite at variance with what might be called a similar condition in an upper tooth.

Dr. Abbott.—In a lower tooth the foramen is a depending opening; natural gravity takes any material left in the root of a lower tooth down to and through this foramen eventually, unless it is packed tightly. The roots of these teeth must be cleaned as thoroughly as the operator can do it. If that be done, he stands as good a chance to succeed as he does in the upper teeth. If the canals are made perfectly clean and treated as I have described, it makes no difference whether it is upper or lower.

Dr. Perry.—That question of cleanliness I advocated ten years ago, and I don't care how a man gets a root clean so long as he does so, whether by washing or by medicines. If your medicines are germ-killers, it makes little difference what you use.

A cordial vote of thanks was tendered to Dr. Abbott for his interesting paper.

Adjourned.

JOHN I. HART, D.D.S.,
Editor New York Odontological Society.

AMERICAN ACADEMY OF DENTAL SCIENCE.

THE regular monthly meeting of the American Academy of Dental Science was held in the Boston Medical Library Association Rooms, March 1, 1893, at 7.30 P.M., President Brackett in the chair.

President Brackett.—The paper for the evening is by Dr. J. Adams Bishop. Subject, "Injuries and Diseases of the Mouth."¹ Owing to the absence of Dr. Bishop the paper will be read by his brother, Dr. H. F. Bishop.

DISCUSSION.

President Brackett.—Gentlemen, you have heard this most interesting and valuable paper. The subject is before you for discussion, and I will call on Dr. Clapp to make the opening remarks.

Dr. Clapp.—It is a matter of very great regret that our numbers are so small, because the historical facts in this paper are not only very interesting but very valuable.

I wish that a description of the manner of holding the parts in place while the impression is being taken had been more fully de-

¹ The paper by Dr. Bishop was read before the New York Odontological Society and also at the American Academy of Dental Science, and will be found in the May number, page 321.—ED.

scribed, for it seems to me that this must be the most difficult part of the whole operation of making these interdental splints.

The thoughts that the paper brings out show how much one class of specialists depends on another, and how one may assist the other, and how necessary the combined ingenuity and skill of all are to the best treatment of the injuries that happen to humanity. These injuries are of such importance to those who receive them that the very best skill is none too good for their treatment.

The amount of pain that may be saved by skilful as compared with that which must be endured by unskilful treatment is a matter of very great moment, and to us it is an occasion of pride that the great advance in the treatment of fractures of the jaw is due to the ingenuity of a dentist, and I hope that a complete and adequate record of this subject will be brought out at the Columbian Congress.

As regards the matter of ingenuity, particularly in original appliances, I am reminded of what was said at the annual meeting of the Harvard Odontological Society last Saturday night by Dr. Hunt. It was in this vein: that dentists have done a great deal in the matter of original research, and that the dental schools of this country are noted for the extent and value of what has been brought forward from an original stand-point. Whereas the medical schools follow largely the lead of the foreign schools, particularly those of the German and French. And he gave it as his opinion that the dental specialty of medicine, as he called it, was destined to be a leader rather than a follower in professional education, and that the field for young men with superior education and superior natural abilities was very great in dentistry. Just here let us think of the preparation that the dentist should have; we cannot say too often that the candidates for the dental profession should be thoroughly examined; that men of ordinary ability have no place at the present time in this profession; that the requirements are so exacting and so great that only those of superior natural ability can hope to take a place and to do the work that people with advanced ideas will require.

Dr. H. F. Bishop.—The suggestion that Dr. Clapp made is a good one, and I wish that my brother had described particularly the processes he uses for taking impressions. He is very expert in that work, and wherever he can he uses plaster, but there are cases where I am not sure that it can be used, and I am sorry that he has not described his methods. In the case of a fracture of the lower jaw, where there are teeth in both jaws, it is sometimes best

to take an impression of one-half of the lower jaw at a time, and then accurately antagonize the two pieces with the model of the upper jaw.

President Brackett.—If Dr. Stevens will kindly take the chair for a few minutes I will say something on this subject.

Dr. Brackett.—It was my rare privilege to make Dr. Gunning's acquaintance in the year of my graduation from the Dental School, and to be an humble assistant of his in the practical treatment of a case of broken jaw. In the summer of 1873, Dr. Gunning was spending some weeks at Newport visiting some of his patients, and shortly after his arrival a girl of a dozen years of age was run over by a fashionable turn-out and sustained a fracture of the lower jaw. It began in the region of the right lateral incisor and extended downward at the expense of the posterior fragment.

A practical thing in connection with this case was that it had been seen by a physician of large experience, and the patient and her family had been told by him that no fracture was present.

This fact came to my mind as Dr. Bishop remarked that fractures are easy of diagnosis. It seems to me that they are not difficult if made by the dentist, but I question if the average general practitioner may always be depended on to make a ready and easy diagnosis in these cases. Dr. Gunning took the impression, but was without laboratory conveniences, and it was my privilege to be of some assistance to him and to Dr. Bishop, the preparer of this paper, who accompanied him, and who showed me in my office how to make the splint. After the return of these gentlemen to New York I was left in charge of the case. I have clearly in mind the procedures which were followed, and they would be practical in a large percentage of cases which we would be likely to meet. Dr. Gunning made no attempt whatever to reduce the fracture or put the two fragments of bone in relation to each other. That was before the days of modelling composition, and plaster was little used for impressions if there were teeth in the mouth. With ordinary beeswax in one of these cups was taken an impression, from which a plaster cast was made, which showed exactly the deranged condition of things. A study was made of the line which the fracture had taken, and with a saw the plaster cast of the lower arch was divided in about the direction that the fracture had separated it. A wax cast was also taken of the upper teeth.

All of the teeth were present in the mouth,—some temporary, some permanent, as you would expect to find in a patient of this age. With the upper arch as a guide, the lower teeth were brought

to the right position with remarkable accuracy, just as we put together the models of a regulating case. Upon this correct model a vulcanite splint was made, proper antagonism being secured by imprinting the plaster model upon the wax.

Two-tailed ligatures were then passed about the necks of each lower temporary second molar, and the splint was applied, the fragments of the jaw coming readily into their right position. The ligatures, previously tied about the teeth, were brought out through holes drilled for them in the sides of the splint, and they were tied securely on top in a little groove so made that the ligatures might not be worn through in chewing. Almost immediately after the splint was put in place the pain was relieved, and, after a very short interval, the patient was doing a good amount of mastication.

The after-treatment consisted simply in keeping the parts as clean as possible with injections through holes made in the splint for that purpose.

Within a reasonable time a gratifying recovery took place.

From that time, for a period of fifteen or sixteen years, I think every broken jaw in and around Newport was in my hands for treatment. Among those which now come to my mind are a soldier in the detachment garrisoned at Fort Adams, who was run over by horses and a field-carriage; a captain of a whaling-vessel, who was thrown violently against the rail of his vessel during a storm; a young man who was struck by a boom on a yacht; another young man engaged in coupling cars, who received a very bad fracture.

Each of these cases had its own complication, requiring time, and in some instances the surgeon's aid, before they were overcome; but ultimately all except the soldier made good recoveries. The injury to his jaw was in the left angle and ramus, and permitted the rest of the jaw to fall backward and turn to the left. Extension relieved his suffering, and one of the problems was how to keep this extension continuous. It came to my mind to use a baseball catcher's wire mask as a point of attachment for stout ligatures which had first been tied about the necks of strongly supported left lower molars. No interdental splint was used in his case, but I think an applicable form would have been the double one, enveloping the upper and lower teeth and screwed fast.

The poor man, for a long time previous to the accident, had been a victim to grave pulmonary and other disease; he had little vitality or recuperative power, and his death occurred some weeks after receiving the injuries.

The procedures followed in the first case that I described should be a sufficient guide to any dentist of ordinary ingenuity in managing an average case. That power of invention which is an essential endowment of every successful dentist will enable him to so modify his procedures as to be prepared for almost any case of the sort that may arise. Physicians and surgeons are ready to recognize the dentist's superior advantages and resources in the management of broken jaws, and to give him the full share of credit that he deserves.

Dr. Cooke.—Before we pass the subject I move that a vote of thanks be extended to Dr. J. Adams Bishop for his very valuable paper, and also to Dr. H. F. Bishop for his kindness in presenting the same, together with the interesting specimens, to the Academy.

A unanimous vote was passed.

President Brackett.—If the members have nothing more to say on this subject we will pass to "Presentation of Specimens and Incidents of Office Practice."

Dr. Clapp.—I want to speak of one incident of practice. Within a short time I have had two cases where the teeth have been cut away in order to fill the approximal surfaces, and now the teeth have come together at the necks, decay has reappeared around nearly all the fillings, and the amount of labor that is necessary on my part, and the patience and pain necessary on the part of these patients to get their mouths in a comfortable condition, is almost appalling. These cases show what seems to me a criminal practice of cutting away teeth to facilitate their filling.

In one of these mouths there is a peculiar condition. It was presented to me the day before yesterday. The four sixth-year molars were extracted many years ago, I should say before the eruption of the twelfth-year molars, as the second molars had taken the place of the first. Between the left superior second bicuspid and the adjacent molar is a swelling, and an abscess is threatened. I cannot find that any of the teeth on that side are dead, neither is there any apparent disease of the alveolus, and still there is a swelling like that caused by an abscessed tooth. I should like to know if any of you can tell me what causes it. It has occurred to me that possibly when this sixth-year molar was extracted, a sliver, the end of one of the roots, might have been left in, and that may be the cause of this lesion; that is the only explanation I can think of.

President Brackett.—I have had a parallel case that proved to be due to just what Dr. Clapp has suggested may be the cause in the case presented to him.

In the extraction at an early age of a right upper first molar a small fragment of a buccal root had been left. The contiguous teeth moved so as to be nearly in contact, and many years after the operation on the first molar the root fragment made a disturbance simulating an abscess of the second molar.

Dr. Clapp.—I have never had a case of this kind. I have had those of abscess arising from disease of the alveolus where there were no dead teeth, but in this the gum and alveolus is apparently healthy all about these teeth.

Dr. Stevens.—I had a case the other day that was very gratifying to me which I would like to tell you about. A boy, about fifteen years of age, who had never had any dental operation performed and who was very timid, came to the office, and was taken sick and had to go home after having almost nothing done. He came again, and I managed to cleanse his teeth, but it was a difficult task, as he was sick both in his head and stomach. He came again by appointment to have some filling done, and again became ill, and went home and had to lie in bed all that afternoon. It was simply a case of nerves, and I told the mother that one hour before he visited the office she should give him a five-grain phenacetin powder. She did so, and when he came I gave him another five-grain powder. The result was both surprising and gratifying, as the boy sat in the chair for over two hours without making any complaint or feeling any nervousness, and I succeeded in filling five cavities without any difficulty.

WILLIAM H. POTTER, D.M.D.,
Editor American Academy of Dental Science.

ODONTOLOGICAL SOCIETY OF PENNSYLVANIA.

THE regular meeting was held June 10, 1893. Vice-President Dr. C. R. Jefferis in the chair.

Before the question of the evening was taken up for discussion, Dr. Truman exhibited the Morgan-Maxfield disk-mandrel, as many present were not familiar with it. Its great simplicity, admitting of rapid changes in the disk, and firm retention constitute its principal advantage over some in the market.

Dr. Boice mentioned the case of a lady who had lately been treated by physicians for some lesion supposed to be connected with the ear, but which he demonstrated to have its origin in a

wisdom-tooth. The pulp was exposed, and the application of sulphate of morphia allayed the pain. The pain in the ear was altogether of a reflex character.

The question of the evening was then taken up for consideration: "To what Extent and under what Conditions are the Collar and Crown the Cause of Pericemental Inflammation?"

Dr. Kirk opened the discussion. He said, "All subjects of this character present two phases. The first, the practical or utilitarian side, and, second, that of the philosophical or scientific, from which we deduce certain principles or rules for the application of the art. In that view, it seems to me, it will be better to invert the order of the question, and say, Under what conditions and to what extent is the collar-crown a cause of pericemental irritation?"

"In the first place, the collar crown, as I understand it, includes all crowns of the Richmond type, and will also include any crown in which a collar is made to encircle the root. The only proper answer to the first part of the question seems to me to be, when it is an irritant, and that brings out the question of the conditions under which it may be an irritant. It may become such when the crown is improperly constructed. The accurate fit of a crown implies the proper preparation of the root and the proper preparation of the crown. The greatest source of failure in crown-work is when an attempt is made to fit a collar and crown to a root which is flaring at the free end. It is a mechanical impossibility to make a band fit a root in the mouth which has a flaring end. The flaring root-end with a band placed upon it produces a V-shaped gutter around the root which affords a lodging-place for food *débris*, and the margin of the gum becomes inflamed in consequence. There is a parallelism in the case of inflammation by reason of an irritating collar and inflammation about a tooth suffering from pyorrhœa alveolaris. The ragged edges and imperfect finish of the collar is an important item, but I think one of less importance than the first-named cause,—viz., imperfect adaptation of the collar to the flaring root-end. Drs. Black, Barrett, and some others hold that under certain systemic conditions irritation of the pericemental membrane produces a deposit of sanguinary tartar which becomes a local irritant. Both of them hold that such deposit may take place without the previous formation of a pus-pocket similarly to arthritic deposits in the tissues about a joint. This I never have been able to establish definitely; but we do have irritation at times from a band encircling the root, and subsequent conditions similar to those present wherever we have a deposit of sanguinary tartar.

From the irritation of the collar-crown we have a subacute or chronic form of inflammation on which from time to time develop periodical attacks of acute inflammation exactly similar to that which we have in typical forms of pyorrhœa.

"The question of the depth to which the band is forced under the gum is, I believe, of less importance than that of its adaptation. It is remarkable to what an extent a collar may be forced under the gum, if it accurately fits the root, if all the free edges are burnished down, without producing irritation. If it be a question of fit and depth of collar, it is important that this depth should be accurately gauged, and the fit should be carefully made.

"Another important point is the restoration of the anatomical contour of that portion of the root which has been removed. I present for your inspection two pieces which, to my mind, are ideal crowns in their construction, and a crown so made would not produce irritation to the gum. These are crowns figured in the *Dental Cosmos*, made by Dr. Shields, of New York. I have never seen any work that is so nearly perfect in its adaptation as that which he has made. His method is fully described in the *Dental Cosmos*, but as the illustrations do not show the remarkable beauty of the work, I brought these samples for inspection.

"The circumstances which are likely to produce irritation are those of imperfect fit and heavy, irregular edges. As to the extent of irritation it seems to me equally clear. It may go on until the tooth is completely lost by continued inflammatory action, the same as pyorrhœa removes the tooth from the socket."

Dr. Deane.—There seems to be nothing left unsaid by the former speaker on this subject, but I cannot agree fully with all of his remarks. I understood Dr. Kirk to say it was not material to him how far the band may be driven up on the neck of the root if it be a fit. I believe there is a limit to this, and you have reached that at the alveolus. To force a foreign body above this line will cause irritation, and through the different stages we reach suppuration. I have in mind a case which illustrates this. A lady called about a year ago with the left superior bicuspid capped with a gold crown very loose and the root very much inflamed. A discharge of healthy pus appeared on the distal margin of the gum, and the tooth was extremely sore to the touch. I succeeded in removing the crown, and as I have it here, you can examine it. The distal portion of the crown was left somewhat longer than the balance. I found, on examining the root, that this was done in order to cover a space destroyed by decay, that portion of the root being com-

pletely destroyed up to and above the alveolar line. After a few days' careful treatment the flow of pus had disappeared, the soreness left the root, and, much against the patient's will, I made an effort to restore the parts. I first set a post of wood into the root, extending down below the gum-margin, then with a thin matrix of platinum forced up the distal side of the root until it passed the alveolus. I formed a cavity for an amalgam filling, packing this with a quick-setting amalgam. I removed the matrix, withdrew the wooden plug, and I had restored the original contour of the root. A so-called Richmond crown was mounted. I saw the patient yesterday, a lapse of about one year's time since the operation, and she assures me she does not realize any trouble in the case at all. This and some others convince me that we must not band the roots too high. And again, this trouble is increased by allowing the surplus of phosphate of zinc to be forced out around the band rather than place a vent for it in the crown of the tooth; the latter method I believe to be preferable. To my mind, a band around the root of sufficient width to protect the root and keep it from splitting ought not to cause pericemental inflammation.

Dr. Kirk stated that Dr. Deane had misunderstood him; that he freely acknowledged that it was a source of irritation, but he thought less than that of an ill fit. He agreed with Dr. Deane that it should be simply butted up against the pericemental membrane.

Dr. Truman.—One expression in the remarks made this evening by several seems to me to imply a degree of ignorance, and should not be used, and that is, "Nature tolerates." According to my view, all operations of nature are governed by law, and is, therefore, universal in its application. There may be apparent exceptions, but it is our duty to discover the cause of these. Where there is apparent antagonism to the universal law of irritation, there is a reason for it not to be explained by the phrase, Nature tolerates it. Wherever there is roughness or space between the band and the root there will arise fermentation through the development of micro-organic life, and this will act upon the pericementum and finally end in its destruction. The objection that I have always held to banding teeth, while it has been modified in the course of years, still holds in regard to this treatment. As a rule, if a band is forced down on the pericementum, it is a reasonable inference that inflammation will follow. The pericementum is a delicate organ. Undue irritation will arouse inflammation. The symptoms are precisely the same, in my judgment, to those found in pyorrhœa alveolaris, and while this subject is not up for discussion, it can hardly be

passed over, because the action of a band where it produces irritation simulates exactly that condition. You can have pyorrhœa produced by irritation, and that may proceed from a slight disturbance of the parts, and then extend to the pericementum. This may be produced by ligature or rubber dam. You have all noticed the bleeding of the gums upon the use of the brush. If you examine the gums you will find a red line on one or more of the teeth, and that line is simply the beginning of inflammation, and it will occur when a band is put on a tooth, unless it is perfectly made, and I question the possibility of making one absolutely perfect. The reason many do not produce irritation is simply the temporary effect of the phosphate of zinc; as long as that remains intact there may be no trouble, but as soon as the smooth surface gives place to the roughness, caused by acid action, the conditions are present for irritation.

Dr. Woodward.—I saw a case a few years ago, after the Richmond crown was first brought forward, in which a crown had been placed upon a bicuspid root. The root was one which tapered rapidly from the gum to the apex. In less than six weeks after it was put in the patient removed it with the thumb and forefinger, and with it came a piece of the alveolar process. This was the result of a band around the neck of the tooth.

My experience with the collar is that if it fits the root closely you will get very little irritation, but the gum invariably recedes from the collar. In time the band, which was once covered, will be found to be uncovered. In cases where the gum does not recede there is usually a low form of inflammatory action. I think if anything interferes with the attachment of the gum to the root, whether it be a piece of rubber or a ligature or a wedge or any substance, it will be followed sooner or later by recession of the gums. It naturally recedes as we grow older, and horse-jockeys take advantage of that fact when they want to buy or sell a horse.

Some years ago I filled two teeth for a gentleman, and had great difficulty in keeping my rubber above the cervical margins. Eight years afterwards the gum had receded to such an extent that I wondered that it had ever given me any trouble to keep the rubber dam on.

Dr. Boice, by drawings on the blackboard, described a case of a central incisor, broken off, and which he had built up for a patient. He first forced in cotton saturated with varnish, and used gutta-percha, wax, and chalk; coated it over until the gums would not bleed, and then proceeded to fit a brown or gold ferrule over the

free margin, and inserted a post to hold it in place; then filled with amalgam, and fitted a crown. It had produced no irritation.

Dr. Gaskill stated that he had had a case three years ago similar to the one shown by Dr. Boice, and that it had produced no trouble.

Dr. Pierce, in answer to Dr. Truman's remarks, said, "In speaking of nature's toleration I had reference to the different conditions of patients and the success that was attained when working under adverse circumstances. My surprise has been that nature so readily tolerates the application of crowns or caps or collars on the roots of teeth. Of all placed in the mouth, there are very few that have the adaptation of those exhibited here to-night, and yet a large proportion are worn for years with great comfort, and they are tolerated by nature, though not fitting accurately. There are hundreds of caps and collars put in that do not have the adaptation described by Dr. Kirk. The irritation that we have usually caused by the collar and cap is as much from the improper condition of the root as from the fact that it wears a collar. Although the operation is not a complete success, so far as workmanship is concerned, yet the absence of fit is not always the source of irritation."

Dr. Bonwill.—I ought not to say one word on crowns after I have spoken so often on the subject. Every one knows that I am opposed upon principle to a collar being placed upon a tooth. I cannot see where strength is increased, yet some claim there is, and that it prevents the cement used to secure it from becoming injured. My experience began in 1873, when I first put on a crown independent of a wood pivot. I went to all extremes in taking anything and everything offered me. I wanted to see what was the farthest extent I could go to. If we examine the teeth that are to-day pivoted by the average dentists, we find there is very little decay in the root of the tooth. So far as injury to the pericemental membrane is concerned, I have a tooth here treated by a dentist in the country. When it came to me it was in a general state of ulceration from the apex. You can see the condition in which the band was placed in the mouth. The pericemental membrane was entirely gone. I suppose the cause of it was the collar. I know that for ten years before the tooth had had a gold filling in it. The gentleman was in the country when the tooth troubled him, and he went to the nearest dentist, who placed this crown, and the consequence was its entire destruction. Without a collar it would have been in his mouth to-day. I have one

here I placed in fifteen years ago with a nut and screw. Finally, a large part of it broke away. I filled it in with amalgam, and had no idea it was so rough until it came out. It lasted for seven years in that condition. Judging from the number of cases I have seen treated in the hands of others, I see no reason to change my views. There are a few cases where I would put on a collar, but would cement it with a pin in the root of the tooth, then I would have something by which I could hold it, and it could not move; but to depend on pushing a crown with a band on it with ordinary cement, and expect that collar to sustain the root, it will not do it. If you put it up high it will produce inflammation that will destroy the tooth. So my experience has been against collars, and especially the manner in which they are placed.

The specimens exhibited here to-night show that any one who knows how and where to cut can do it, but it cannot be done in the mouth. (Dr. Kirk, in answer to a question of Dr. Bonwill's, replied that the work was not done in the mouth.) There is no use of bringing such samples here and expecting us to do it. They are entirely misleading. Dr. Kirk does not expect to make such successes as that. I object to so much gold upon the cutting edges and upon the grinding surface of the tooth as you are compelled to put to keep them from being fractured.

HARVARD ODONTOLOGICAL SOCIETY.

THE monthly meeting was held at Young's Hotel, Boston, on March 30, 1893, at 6 P.M., President Eddy in the chair.

The paper of the evening was read by E. C. Briggs, M.D., D.M.D. Subject, "The Dentist as a Prescriber of Drugs."

(For Dr. Briggs paper, see page 567.)

DISCUSSION.

Dr. Keep.—I would like to ask Dr. Briggs if, even in the matter of food-supply, there is not the same objection which he urged against the giving of drugs,—that you would not be able to see your patient frequently enough to observe its effects? Would it not be better even to leave that to the family physician, if necessary giving him hints as to what is needed? Would you be able to follow it up so well as the family physician, who is more familiar with the family history and with the patient?

Dr. Briggs.—My ground as regards food-values is, that you see the children in comparative health,—that is to say, in your relation as dentist a child is brought to you who may need, and you see he requires (provided you have been posted on food-values), a marked change or regulation of his diet, when ordinarily the physician has never been called. The child is not sick, and it is not a case where there is any drugging required; all it needs is simply a change of the diet. Now, if a child, through a false idea of its parents, has been fed on oatmeal every morning, and is showing symptoms of acid dyspepsia, and yet not ill enough to call in the family physician, you would simply recommend them to give it to the child every alternate morning, or only once a week, or stop giving it altogether, and in such a case you are not doing anything from which the patient might be in danger, as you would if you prescribed a cathartic. In prescribing a drug one should know the result. That person may be susceptible to the drug, and if you were a physician you would visit the next day and see how your patient was affected; but if you are a dentist, you do not go. That is the point where I contrast those two: drugs are usually prescribed for those whose condition is in some way below normal, whereas in hygiene and diet, in food-values, you enter upon their use in what is ordinarily called health.

Dr. Keep.—Have you observed many cases in which much change has been brought about by a change of diet?

Dr. Briggs.—In regard to what?

Dr. Keep.—In regard to conditions of the mouth and development of the teeth.

Dr. Briggs.—I can't say so much about the teeth, because I think that is the hardest thing to get at. I have observed changes in condition brought about by a change of diet which I felt were bearing on the mouth,—notably in abscess in the mouth, dyspeptic troubles, and all those things which more or less affect the teeth.

Dr. Clapp.—I suppose there are few questions that are asked us oftener than in regard to diet. I have one form of reply to these interrogations; it is this: Feed your children so that the entire system shall be brought up to the highest development. I do not believe in any specific dieting,—that is to say, I do not believe in feeding phosphates to make teeth, for this reason: in the mixed, ordinary, plain food there is sufficient material for the building up of the different parts of the system. Now, what is the use of overloading the system with phosphates when the conditions are such that the phosphates will not be assimilated? So I make this rule:

advise that the feeding shall be simple, plain, and nourishing, without specific anticipation of improving the teeth by giving phosphates or things of that kind. I have one special case in mind,—a little patient who is now, I think, nine or ten years of age. When this little girl was born she was perfectly healthy and was, and is, an ordinarily healthy child. She was fed on rigid principles of diet, I think, until she was five or six years of age,—probably she had no meat at all, but she had the various kinds of grains that are on the market called “health foods,” and plenty of milk and fruit. The mother expected that the teeth, especially the sixth-year molars, would be the ideal of perfection. The result is that they are about as poor sixth-year molars as I have ever seen. They are of the kind that you might designate as “honeycombed.” They are filled with little pin-hole cavities, the seams running in the enamel from the centre outward are badly decayed. When they first began to decay I filled them with cement, cutting them out as much as appeared to be necessary, but at each subsequent sitting I found that the decay had gone still farther and that the smallest pits had become quite large cavities. Now, I do not know whether this was a proper case of feeding or not, and I don’t know but that the teeth might have been very much worse if the child had been fed in any other way, but it is a case where this kind of feeding did not make good teeth.

Dr. Smith.—I think feeding has become quite a science. The discussion has brought to my mind a clipping which I took from the *Boston Medical and Surgical Journal* some years ago. I have it in my scrap-book. That article contained a quotation from a German medical periodical, giving the experience of some German scientists experimenting on guinea-pigs with the different kinds of food-supplies, and, if I remember rightly, giving them the phosphates in the form of syrups for their bony structure. An examination in all those cases proved that the phosphates were passed in the fæces.

I have known cases where in a family of children some of them having poor teeth were given phosphates, all of them living on the same diet,—that is, as near as a number of children at the same table would be apt to, some of them eating one thing and some another,—and yet the children having poor teeth were none the better for the administration of the phosphates; and these things teach us that while we may see teeth that need the phosphates, still there is no direct route that will take them into the system and carry them to the teeth. Even if there was such a route,

and you could depend on perfect assimilation, I believe there would still be something needed for the preservation of the teeth and making them harder. I believe the teeth need exercise. Take an athlete. He is particular about his diet, yet if his arm be strapped down by his side the greatest possible care in dieting will not harden the muscles of that arm. He must use those muscles constantly; and not only must he exercise, but produce friction with towels and rub-downs to bring the blood there and give the parts new vigor. Now, when we see teeth of poor quality the circulation is generally at the low ebb, so to speak, and they need exercise; much harder foods should be used for the purpose,—not substances which require little or no mastication,—and this should be followed by a thorough rubbing of the gums and teeth with proper brushes. This has a great deal to do with the benefits derived from food-supplies, and is a great factor in the attempt at improvement of the quality of the teeth, and particular stress should be laid upon it, I think, in advising patients in the care of their teeth.

Dr. Werner.—I agree heartily with what Dr. Smith has said. I think the problem of elimination of effete substances needs study more than that of feeding. We must work; we must produce a hunger in the tissues, in the molecules; then assimilation will take care of itself. Preventive medicine stands highest, and the days of wholesale and indiscriminate prescribing of drugs are gone by. In the daily struggle for a living, for an education, we neglect the laws that govern health, and physical culture is little thought of when most needed. Gymnasiums were not as popular twenty years ago as they are to-day. We cannot in the course of four or five years build up a degenerated dental organization. It will take several generations to do that.

Dr. Taylor.—I would like to ask Dr. Briggs if he has noticed any change in the conditions about the gums in pyorrhœa which he thought was due to any dietetic change? I think he must have had something in view regarding that when he wrote, and I would like to know if there is anything that will have any good effect on that pathological condition.

Dr. Briggs.—I shall have to answer that at present in the negative; it is only a theory with me and I have nothing yet to present. Some day perhaps I shall have,—at least I hope to. I cannot help feeling that that is the direction in which we will find relief.

In speaking of diet, you will remember in my paper I said "Hygiene and Diet." You cannot do anything with the latter un-

less you have the former. You might as well expect to produce offspring from the female without bringing the male. You must remember that the two go together. In order to be utilized, foods have to be oxidized, and in proportion as they are oxidized properly are they used in the system. In the matter of supplying phosphates, it may be that we have not as yet found the proper way to introduce them in order that they may be assimilated. We make the general statement that the ordinary food contains the proper amount of phosphates, but at the same time it is a fact that we meet with many instances where the conditions are such that the phosphates are not assimilated, and unless those conditions are altered the tendency is not to utilize the phosphates, but to eliminate them. We give a child a certain amount of starchy food, and in eating that with the proteids, the oxygen that is taken oxidizes the starchy food first, then if there is not enough to oxidize the proteids, they are cast off, and you will find the phosphates in the fæces. It might serve as an illustration to compare this action with feeding a couple of pigs, a big one and a little one. If there is no more than the big one can take, he will get it all, and so if the starchy foods are greatly in excess of the proteids and only a certain amount of oxygen is given to that child, either from lack of proper exercise or from lack of good hygienic surroundings, why, then the starchy foods will grab the oxygen and the phosphates will not be taken into the system. In bony diseases similar results are produced by this perverted nutrition; for instance, the disease called rickets belongs to improper diet and improper hygiene, —correct these and you correct the rickets.

Dr. Smith.—I would like to ask the essayist if he believes that it is possible, or if it is not possible, if it is wise, to make the attempt to discover some drug or drugs that may be administered in the incipient stages of an alveolar abscess to abort it? To-day we treat alveolar abscesses entirely surgically, that is to say, the majority of dentists do. It is not necessary for me to go through the treatment that we use. The remedies that we use are topical, and in most cases we do not enter upon any systemic treatment. I do not know that it is necessary at all to come to the defence of Dr. Taft, but the essayist speaks of his paper and draws the conclusion that the field into which he has entered is rather a dangerous one for the practitioner of dentistry. If I have drawn the proper conclusion from the essay presented this evening, it is the claim of the essayist that the administration of drugs should be left wholly to the physician. As I recall Dr. Taft's paper, I believe he went into

the administration of drugs to a limited extent, notably in cases of alveolar abscess, and he cited those cases which were benefited by his treatment. Now, the drugs which he claimed would benefit or cure these lesions were supported by tabulated records of his cases. But he was honest enough to say in his paper that the efficacy of any method could not be established until many cases had been tabulated, yet in homœopathy they claim that they do cure alveolar abscesses by the administration of homœopathic drugs. They may differ as to the attenuation of medicine to be given,—some using the high potencies and others the low,—yet they all agree that they aid very much and sometimes cure alveolar abscess. Now, in my own practice I have witnessed cases where patients, physicians in homœopathy, have taken their remedies for alveolar abscess during the time I was treating the abscess surgically, and they seemed to get along unusually well. It may have been simply a coincidence; I won't jump at conclusions, as many of our homœopathic friends are apt to do. And, by the way, that reminds me of an incident which is a little foreign to the subject, but so patent an illustration that I can't help speaking of it. The wife of a prominent homœopathic physician went to a dentist to have her teeth cleaned. The teeth were in a very advanced stage of pyorrhœa and one of them was very loose; after removing the tartar this tooth seemed to be looser; thereupon the physician claimed that the cleaning of teeth was injurious, and the teeth should never be cleaned. He is a gentleman who stands very high in homœopathy, but if he arrives at all his conclusions in that way, his science is considerable of a farce.

Now, the school of allopathic physicians claim they can do nothing in the way of systemic treatment for alveolar abscess; that the matter is on the surface, and should be treated there. If that is an established fact, then there is nothing we can do but to let it go on through the swelling and regular abscess, but if there be another way to treat alveolar abscesses and to abort them, then we are very unwise not to look into it. This is what Dr. Taft is doing, and to that extent I wish to encourage him in his investigation and in his administration of drugs.

President Eddy.—I would like to ask Dr. Keep, as a graduate of medicine, if the old schools do not give sulphide of calcium to prevent an abscess forming, with good results?

Dr. Keep.—I don't know whether that is the practice or not. I know it has been the general rule to give cathartics when there was any local inflammation.

Dr. Smith.—I would like to have Dr. Briggs answer my ques-

tion. I talked a good while after asking it, and don't blame him for forgetting it.

Dr. Briggs.—My reply to that question would be that there is no doubt that in cases of alveolar abscess, or in any like trouble, there are drugs that can be given to palliate or alleviate the symptoms and make the case milder than it would be without treatment, but as for aborting it, I do not understand that any drug can be given to do that. The condition of alveolar abscess is a different thing from the condition of a patient who has boils. Boils are the result of a poor condition of the blood, whereas if a man has an abscess, as a rule, there is a local cause, and if that is once started you cannot control it by giving drugs to be taken into the general system.

To illustrate my point, a patient came to me with an alveolar abscess forming. The tooth was very tender, and its history indicated that it had been filled in the roots. If I had known beforehand that the patient was going to have an abscess, I could have tried refilling it, thinking perhaps it was not filled as thoroughly as it could have been, but it was too late to do that, the abscess was formed and the patient was in a very nervous condition. I gave her topical remedies to be applied, and told her to go home and call in her physician. Now, a dentist cannot properly attend to a case of that kind. If he gives her systemic remedies, he has to go and see her every day as a physician does, and that, of course, he cannot do and attend to his office practice,—something has to be sacrificed. She certainly ought to stay in the house, and not go to his office, and if he is practising a specialty he will hardly find time to run out and see how that pill worked he gave last night.

Perhaps some of the members of the Society have noted a fact that has occurred to me from questioning patients who have pyorrhœa, and that is, that in a great majority of cases—and I cannot say that I ever saw a single exception—there has been a rheumatic or gouty diathesis in the family. I have in mind three cases which were as severe as I ever saw, and in each instance there was a marked rheumatic ancestry.

Dr. Clapp.—I saw two or three weeks ago a model of a mouth where the lower teeth were very much out of place. They seem to have been thrown upward and forward, so that the arch was very much enlarged and extended over the superior arch in some parts of the mouth. There was a very wide separation between the incisors, and it would seem that some influence had been at work to throw the teeth upward and outward, and it was said

that rheumatism was the cause of this change in the mouth. The patient had been a great sufferer from rheumatism, the joints being almost ankylosed. I have held for years that many of the ills suffered by the teeth arise from this disease.

Dr. Briggs.—If you admit that, there comes in your hygiene and diet.

Dr. Werner.—I wish to speak of a case that is a good illustration of our inability to abort alveolar abscess. While operating for a gentleman in a common cavity of decay, last spring, I found the pulp dead. I cleaned out the canal, treated it several times, and filled it temporarily with gutta-percha. Two months after, the patient came to my office with a swollen cheek. The tooth was but slightly sore and could be operated upon very comfortably. I took out the temporary filling, made aseptic applications, and dressed it. Instead of getting better, it gradually became worse, and at the end of two weeks there was so much inflammation that a surgeon was called in, who injected cocaine, made an incision on the inside, and four days afterwards another incision on the outside. It seemed as if there might be some obstruction in Steno's duct which was almost as large as a pencil. Poultices were worn, and I applied, or attempted to apply, two leeches, but they would not take hold. This is a severe case, and I feel that dentists ought to know whether it should be treated systemically. The patient was very sick, and whether the abscess in the cheek was caused by that second molar is an interesting question. I think it was.

Dr. Briggs.—What proof have you of that?

Dr. Werner.—That was the only tooth that was sore, and yet there was no absolute proof, as the root was perfectly clean; I could detect the odor of the campho-phenique with which I treated it last spring.

Dr. Grant.—Perhaps there was an abscess coexistent with the one you speak of.

Dr. Page.—Did you notice the occlusion?

Dr. Werner.—The occlusion was normal. In the sorest condition it did not interfere with his bite.

Dr. Smith.—Why not extract the tooth?

Dr. Werner.—Evidently the patient was developing an abscess. He would in that case have suffered and lost his tooth.

Dr. Smith.—I should expect that the root of that tooth penetrated the antrum, and I should have gone up there to see if I could not find the cause of the trouble.

Dr. Werner.—The inflammation was over the malar bone and was deep-seated. That is where the pus formed.

Dr. Shepherd.—Was there any soreness under the eye?

Dr. Werner.—The whole side of the face was very much swollen, including the eye.

Dr. Blaisdell.—While on the subject of abscesses I wish to report a case from the Dental School the past winter. A young lady had the pulps removed from the right superior bicuspid and the canals filled in the usual way. Shortly after, she returned with an abscess over these bicuspid. The canals were opened and the teeth treated through the canals for two months with no benefit. Every time the dressing was put in, even though only twenty-four hours elapsed, she returned with great inflammation, until the patient was discouraged and wished to have them removed. It was suggested that the student should fill the roots and cavities permanently and then open from the outside directly through the alveolar wall, and with a burr remove what necrosed tissue was there. He did so, and found a large cavity that ran forward from the first bicuspid almost to the central incisors and backward to the second molar. He gave it a thorough burring, washing with peroxide of hydrogen. In two weeks the patient returned with everything healed and no signs whatever of having had an abscess. That was a case that was about to be given up, but a thorough surgical operation brought about a cure.

Dr. Briggs.—I think this only points out the moral of my paper. We want more surgical knowledge, and I should say in Dr. Werner's case either he wanted a little more surgery, proving whether or not the tooth was the offending member, or else the general surgeon should have been referred to earlier. We should not take it upon ourselves to treat an abscess because it is adjacent to teeth any more than the oculist who, in his examination, comes upon a middle-ear disease would attempt the treatment of that. He would send it to the aurist.

I had a case which was similar to the one which Dr. Blaisdell speaks of. The patient came from out of town, and had had a great deal of trouble with an abscess over a bicuspid. She said the pus discharged so freely that she soaked three handkerchiefs in a night. Her dentist had tried in vain to heal it and had advised the extraction of the tooth, but she did not wish it removed. I placed the case first in my brother's hands to have the root carefully filled, and I then made an examination. At first I thought it was a diseased antrum. There was a discharge into the left nostril, and in the

post-nasal examination I could see the pus welling through the left nasal fossa. I began the treatment with opening into the antrum, and found it clean and dry. I then made incisions and introduced the burr over the bicuspid, cutting out quite a piece of the alveolus that was dead. After treating the wound with antiseptic sponge, as described in the *Independent Practitioner* some ten years ago, the patient was discharged cured. That was a surgical operation entirely, and I think we can do a great deal with surgery. We have the field and I think we had better stick to it, and we will find how much more good we will be able to accomplish in that line.

Dr. Keep.—I think we ought to be very careful about making positive statements regarding the value of drugs for aborting abscesses. A large number of cases which at the outset seem to be very threatening and are apparently developing into abscesses disappear without any active treatment. It is a difficult thing to say surely that an abscess will develop,—it may, and it may not; and in view of this fact it is well not to be too sure that favorable issues are the result of any general treatment we may have adopted.

HENRY L. UPHAM, D.M.D.,

Editor Harvard Odontological Society.

PENNSYLVANIA STATE DENTAL SOCIETY.

THE Pennsylvania State Dental Society held its annual meeting, July 11, 1893, at the Mountain House, Cresson Springs. In the absence of the President the session was called to order at ten o'clock by the Vice-President, Dr. F. L. Bassett, of Philadelphia. Twenty members were present. A letter was received from the President, Dr. W. E. Van Orsdel, stating his inability to be present; also a message from Dr. Louis Jack, stating his absence on account of illness.

Reports from committees and the Treasurer's report were read. These embraced interesting and important communications from the Committee on Enforcement of Dental Law, Examining Board, and on Legislative Action. The officers elected for the ensuing year were, President, Dr. F. L. Bassett, Philadelphia; First Vice-President, Dr. J. A. Libby, Pittsburg; Second Vice-President, Dr. G. W. Green; Treasurer, Dr. H. N. Young, Wilkes-Barre; Secretary, Dr. C. V. Kratzer, Reading; Assistant Secretary, Dr. R. B. Cummings.

Examining Board (in place of expiring members).—Dr. Louis Jack and Dr. L. Ashley Faught.

Committee on Revision of By-Laws.—Drs. Libby and Kratzer.

Committee on Enforcement of Law.—Drs. Faught, Hamilton, Fundenberg, Boyce, and Phreaner.

Executive Committee.—Drs. Roberts, Young, Litch, Magill, and Klump.

Publication Committee.—Drs. Magill, Fundenberg, Green, Keiffer, Kirk, and Kratzer.

Committee on Legislative Action.—Drs. Klump, Magill, Libby, Boyce, Young, Thompson, and Peirce.

Clinical Committee.—Drs. Filbert, McQuillen, and Cummings.

COLORADO STATE DENTAL ASSOCIATION.

THE Colorado State Dental Association held its Eighth Annual Meeting in Denver, commencing on June 6, and remained in session until the afternoon of the 9th, during which time eleven very well-prepared and interesting papers were read, and many elicited animated discussion.

The construction of bridges was exemplified in the clinics in a creditable manner.

Dr. S. Davis, of Denver, exhibited a new and novel dowel crown, with platina band, which formed at once a cap and band neatly encompassing the end of a prepared root. After adjustment with the dowel in socket and band in place, a common plate tooth was carefully arranged and secured to band and dowel by means of wax, when the whole structure was removed and invested. After crystallization the wax was removed, and a low flowing grade of body was easily melted over the palatal surface of the tooth, incorporating the pins in the tooth, the end of the dowel passing down by the pins, the platina cap, and the band.

After cooling, the investment was removed and the band covered with gum-colored body and beautifully flowed, so that when the combined tooth, band, and dowel was adjusted on the root no defect in the gingival border could be easily detected. The structure seemed as strong and more desirable than the Logan crown, as it possesses the advantage of the band covered by gum-colored enamel in such an artistic manner as to dissemble its artificial character.

An election of officers for the ensuing year resulted in the selection of P. T. Smith, Denver, President; W. S. Brennaman,

Leadville, First Vice-President; W. R. Sinton, Colorado Springs, Second Vice-President; A. H. Sawins, Denver, Recording Secretary; Mrs. S. M. Townsend, Denver, Corresponding Secretary; William Smedley, Denver, Treasurer. M. A. Bartleson, Denver, was elected delegate to World's Columbian Dental Congress. Glenwood Springs, a most delightful mountain summer resort, was selected for the next annual meeting in June, where it is hoped the American Dental Association can be induced to hold their annual session of 1894. A more favorable place could not be found in all the accessible parts of America.

P. T. SMITH.

DENVER.

Editorial.

AMERICAN DIPLOMAS IN ENGLAND.

IN our last number we alluded briefly to the fact that the General Medical Council of Great Britain had decided to refuse registration to all American graduates. Under the proper heading there is given the memorial from the British Dental Association, an abstract from the report of the Educational Committee of the Medical Council, and the official order.

The course adopted is certainly the only consistent one for the Medical Council to take. In a former number this policy was advocated as the one that would probably prove satisfactory to the schools of this country and avoid much friction in English dental circles.

The reason given for the original acceptance of two colleges to the exclusion of others in this country is doubtless the true one, but was certainly formed on incomplete information at the time it was originated. The adoption of the original law of the Council, based as it was on an unjust discrimination, naturally led to unpleasant feeling on this side of the ocean, and hence it is eminently proper that it should be repealed and all the schools in the United States placed on one common level as far as practice in Great Britain is concerned.

This question of the recognition of foreign diplomas is a very broad one, and concerns all civilized communities. The criticism frequently made against foreign countries for their unwillingness to

recognize diplomas of those outside their jurisdiction applies with equal force to some of the States of the United States where a similar condition of affairs exists.

While we have no sympathy with States that enact laws discriminating against others in the same confederacy, we can recognize that it is the duty of all well-regulated governments to protect as well as punish their own people, and inasmuch as this power is limited by their own boundaries, it becomes their duty to act within that limit with force and consistency. Upon this basis Germany refuses to recognize any foreign degree, and, we think, very properly.

To those affected by this law of exclusion, it seems unaccountable that intelligence, skill, and culture should not be recognized the world over. While it is true that there are only shades of difference between the training, professionally, of any of the civilized nations, and all thus trained can meet on common ground everywhere, as in our international conventions, it remains a fact that there are marked differences in the modes taken of reaching this standard of culture.

The foreign student, whether on the Continent, in Great Britain, or in the colonies connected therewith, must go through a regular classical training to reach any of the professions. In the United States greater stress is laid upon practical developments and less upon that deemed so important in England and elsewhere.

Which of these two positions is the correct one it is difficult to determine. There is evidently room for a variety of opinion and facts sufficient to lead to dogmatic utterances from whichever side the view be taken.

If results are alone to be considered, it may be questioned whether any country can take precedence. All can claim success in certain directions and have equally failed in others. This much must be conceded. It is clearly evident that the time spent in gymnasium and college is not conducive to a higher education in the practical branches necessary for skill in dentistry, and it is equally apparent that the training in what is termed the ordinary branches of education does not fit a man for the scientific culture so necessary in professional work. There will be found exceptions on both sides, the man of higher education, naturally inclined to mechanics, will drop into the proper groove and eventually become not only a good operator and mechanician, but a cultured scientist as well, and the poorly-educated man, through his higher aspirations and unwearied toil, will reach the same position. These ex-

ceptions are not, however, to be relied upon by governments in regulating the work to be performed.

All extremes have proved unsatisfactory, and we are forced to the conclusion that each profession or calling should establish a standard of preliminary training suited to its needs. Something similar to this is recognized in Germany in forming the three classes of schools,—the Gymnasium to train for the universities, the Real Schule for the polytechnic college, the Bürger Schule for the tradesmen and workers generally.

It would seem that a further subdivision should be adopted in the training for different callings. The elective system of some of the universities aims to meet this demand, and it is very satisfactory so far as it goes.

It is very evident that the dentist of the future will not need a Gymnasium or an Oxford or Cambridge training to fit him for the practice of his profession, nor is the work of the common schools adapted to qualify for the curriculum now required. The first overeducates in certain directions, and the other dwarfs the mentality and narrows the views of life.

As the older countries are fixed in their methods, and the United States is undergoing a transition period, an era of experimentation, as it were, it is impossible that there can be harmony in methods. While this condition exists it is proper that each country should stand upon its own ideas and exclude all who cannot meet the demands made.

Entertaining this view, we are decidedly of the opinion that the United States should meet this action on the part of foreign governments by a similar course of procedure. We have not been afflicted with the conservatism of the old civilizations, and have permitted all kinds of people and have welcomed all professions, and have opened freely the doors of our colleges and higher institutions of learning. On broad, generous principles this is right, but there comes a time when the reciprocity of political science may be safely adopted upon professional lines of work, and that time seems to be nearly at hand. We could say to the people of the Old World, "When you will take down your bars we will lower ours, but until that is done we will not recognize your diplomas nor receive your scientific men to the exclusion or injury of our own people."

We think this important question should be met, for our specialty, in the Association of Dental Faculties and the National Board of Dental Examiners, and should be viewed in no narrow, sectional

spirit. The world must eventually come to a comprehension of the truth that the spirit of Chinese exclusiveness will not answer for the enlarged sphere which the active thought of the future must take, and lines of education based on egotistic assumption of superiority will not be the best foundation upon which to build professions.

THE "PACIFIC COAST DENTIST."

WE have received the first number (June) of this journal. It is under the charge of Joseph D. Hodgen, D.D.S., assisted by a number of dentists in San Francisco and elsewhere on the coast.

The initial number gives promise of a permanent place in the literature of that section of the country, the contents being above the average of first numbers.

The name does not seem to be happily chosen, it not being adapted, in our opinion, to a monthly professional journal. We wish our contemporary a successful career in the journalistic field.

DR. CROUSE ON EXPENSES TO THE CONGRESS.

WE desire to call special attention to Dr. Crouse's communication under the head of "Domestic Correspondence," giving the facts regarding expenses at Chicago. There has been a mistaken impression abroad regarding this, and it is well to have the matter set right by so good an authority.

The few days which will elapse before the World's Columbian Congress will meet should be days of active preparation by every dentist to make one in that great body. It is presumed that before this reaches our readers the railroads will have reduced the fare in every direction. If this be done with some regard for the comfort of travellers there should be a large delegation from the East.

We have it from excellent authority, outside of Dr. Crouse, that the expense attending the convention need not be greater than that of the ordinary annual convocation.

If this Congress will have the effect of educating dentists to the advantages to be desired from attending annual gatherings, it will have performed an educational service not considered primarily as one of its good results. The apathy felt in dental circles regarding their annual meeting, both North and South, is not altogether cred-

itable to a profession calling itself scientific. There is, therefore, much to hope from the training and experience which this week at Chicago will give to those not familiar with the work, and we hope not hundreds but thousands will avail themselves of the opportunity.

Bibliography.

FORMULAIRE PRATIQUE POUR LES MALADIES DE LA BOUCHE ET DES DENTS. Par G. Viau, Professeur à l'École Dentaire de Paris, Société d'Éditions scientifiques. Paris, 1893.

This book is somewhat similar to the "American Compend" in that the author endeavors to condense the various pathological conditions the dentist is called upon to treat into as small a compass as possible. He then follows this with various formulæ suitable for the treatment. These are prepared with care, and, doubtless, in many cases will be of advantage. They are generally selected from writers in various parts of the world, hence have a special value in that they are the result of wide experience and different climatic conditions. The formulæ for dentifrices are quite extended, covering twenty pages, principally from the French and German.

The second part is devoted entirely to cocaine anæsthesia and an addendum upon the agent recently introduced,—tropacocaine.

COLUMBIAN EDITION. LETTERS FROM A MOTHER TO A MOTHER ON THE CARE OF CHILDREN'S TEETH. By "Mrs. M. W. J." Third Edition. Published by the Wilmington Dental Manufacturing Company. Philadelphia, 1893.

This well-known, and in many respects very valuable, little book has reached its third edition, giving evidence of filling a place in the instruction of those for whom it was intended.

The necessity of this instruction must be apparent to every practising dentist. The real work of saving teeth begins or should begin in the nursery, where it is probably the least regarded. The suffering which might be saved by timely knowledge and care cannot be estimated. Some of the ideas sought to be inculcated under the chapter on "Food Principles" are not in accord with recent teachings, especially that in regard to the use of lime-water in increasing

the density of hard tissues. There is no evidence that lime taken into the system in this way is assimilated.

The book is written in a way well adapted to arrest attention, and could it be freely distributed outside of professional circles it would do an incalculable amount of good to generations yet to come.

Obituary.

CHICAGO DENTAL SOCIETY—DR. W. W. ALLPORT.

THE following Resolutions on the death of Dr. W. W. Allport were adopted by the Chicago Dental Society.

WHEREAS, In the death of Dr. W. W. Allport a leader in our profession has fallen, as a mark of our appreciation of his services and skill be it

Resolved, That in his death the dental profession has lost a member whose extraordinary skill as an operator placed him among the foremost dentists of the world. His work in promoting the highest interests of the profession will ever be conspicuous, and the prosperity enjoyed by younger members is due in a great measure to his achievements.

Resolved, That a copy of this preamble and resolutions be sent in proper form to the family of the deceased, and also to the INTERNATIONAL DENTAL JOURNAL for publication.

TRUMAN W. BROPHY,
A. W. HARLAN,
J. N. CROUSE,
Committee.

Domestic Correspondence.

LIVING IN CHICAGO DURING THE FAIR.

CHICAGO, July 7, 1893.

EDITOR OF INTERNATIONAL DENTAL JOURNAL:

SIR,—From letters received from dentists in different parts of the country I am inclined to think there is a lack of information as to the expense of living in Chicago during the season of the World's Fair. Board and lodging were never more reasonable than now. Rooms can be had, where two are willing to room together,

for fifty cents a day each. First-class rooms and accommodations can be had from a dollar to a dollar and a half per day when the parties wish to room alone. The highest-priced hotels are entertaining people for five dollars per day, room and board. For twenty cents, in restaurants just outside of the Fair grounds, will be furnished three eggs, a cup of tea or coffee, and all the bread and butter one wants. For thirty-five cents can be had a good, well-cooked steak, potatoes, a cup of tea or coffee, and bread and butter.

The boat, railway, and street-car companies are doing all in their power to furnish the best and cheapest transportation possible.

Of course there are a few catch-penny schemes, but they are not in connection with the responsible hotels or the Fair. Considering the size of the Exposition, the number is remarkably small.

I have made this investigation for the purpose of informing the dental profession of the exact facts concerning the expense here, and would urge upon every one to remain as long in Chicago as possible. A month or six weeks can be spent very profitably in seeing what the world has done and is doing, and a longer time could be used to great advantage.

J. N. CROUSE.

Notes and Comments.¹

PYORRHOEA ALVEOLARIS.—Many who have spoken at dental meetings upon this subject, and some who have written for the journals, have laid the cause to certain systemic conditions, such as gout and rheumatism; others attribute it to the excessive use of saline foods, etc.; while one writer says, "I have never seen an actual case of pyorrhoea alveolaris where the patient was in perfect health."

This subject is one deserving of greater attention and study than it apparently receives. Though we occasionally have valuable contributions, it seems difficult to bring the profession to one opinion

¹ The assistant editor solicits contributions for this department,—new methods, new remedies and formulas, or any short practical note which may prove of value to the practitioner or student. Address 1506 Arch Street, Philadelphia.

in regard to this branch of pathology. It can be stated, beyond a doubt, I think, that the appearance of pyorrhœa alveolaris is due to a calcic diathesis, as are a number of the dental lesions, such as hypercementosis and nodular dentine. This condition manifests itself by the deposit of calculus upon the necks and roots of the teeth, which deposit is either salivary or sanguinary, or both. In studying this subject, it must be remembered that salivary calculus causes inflammation, and that serumal or sanguinary calculus, which is found upon the roots of the teeth, above the gum margin, is the *result* of inflammation; and our observation leads us to the conclusion that this deposit is very often, if not nearly always, caused by the presence of the former, owing to its irritating effect resulting in inflammation of the soft tissue surrounding the teeth. While this, when promptly and properly treated, is not serious, it is, where the patient does not give careful and regular attention to the teeth, owing to its insidious character, one of the gravest diseases of the teeth, and is probably causing the loss of as many teeth as does caries.

After a tooth has been lost by this disease, examine it closely under a strong glass, and see how the pericemental membrane has been destroyed, and how the root is nearly, or quite, covered with a calcic deposit. Go farther: cut the tooth open, and see how the pulp has diminished in size, or has become calcified altogether. What does this mean, but simply that the patient is of a calcic diathesis? We wish to add, further, that during the past six months we have treated five cases of pyorrhœa alveolaris where the patients' general health was excellent.

THE FUNCTION OF THE SCHOOLS.—It has been charged frequently that the dental schools are engaged in making scientific men rather than dentists,—that is, that too much theory and not enough of the practical is taught. Instances are cited where graduates are not able to perform as good an operation as some practitioners who have never attended college, etc. In fact, one old practitioner, whose name is familiar throughout the country, made the statement, not many months ago, that he could take a young man into his laboratory and make a better dentist of him in six weeks than is the average college graduate. It might be said here that this same doctor (?) has recently contributed a series of papers to one

of our professional journals which have to many been a sad disappointment, giving evidence of the absence of a good college training.

These criticisms, as Dr. Barrett says in the *Dental Practitioner and Advertiser*, are almost invariably made by illiterate men. He says further, and wisely, too, that the education of the dentist should not begin in the laboratory or operating-room. Before the student is prepared to commence operations in the mouth, he should be taught the underlying principles upon which a true practice must be founded. To put even the finest filling into a diseased tooth, perhaps over a dead and putrefying pulp, is not dentistry. To insert even the most beautiful artificial denture over tissues that are in an inflamed and sloughing condition is not good practice. All true practice must be founded upon true science. There must first be a comprehension of what is physiological law before one is fitted to deal with pathological cases.

EDUCATING THE PUBLIC.—Upon the subject of the dental education of the public, Dr. W. C. Barrett says, "I cannot but believe that the only dignified, professional, manly way is to continue within professional lines, keep out of the newspapers, and leave the advertising business to those who know more of it than we do; to diffuse information that is legitimate, whenever we have the opportunity to do so, in a place in which we know that it will be respected, and thus in time surely to build up a reputation that cannot be successfully attacked, and which will secure the respect even of the modern newspaper reporter."

Dr. Barrett usually says the right thing in the right place, and in calling attention to the above paragraph we can but add we have always felt that the best way to reach the public and educate them in dental matters is to elevate and broaden the education of those who enter the profession. What a responsibility for our colleges, examining boards, societies, and journals!

In fact, dentistry, as we have previously stated in these pages, seems to form a connecting link between the professions,—the healing art and mechanics,—and in its highest development exemplifies each.

Current News.

MEMORIAL OF THE BRITISH DENTAL ASSOCIATION TO THE GENERAL MEDICAL COUNCIL OF GREAT BRITAIN.

"WE, the undersigned, licentiates of dental surgery of the Royal College of Surgeons, desire respectfully to call the attention of the Medical Council to the following facts :

"After the passing of the Dentist's Act in 1878, and the settlement of the dental curriculum of the United Kingdom by the Medical Council, the question of the recognition of foreign diplomas for registration was raised.

"It was then on examination found that no foreign dental diploma testifies so complete and so lengthened an education as the United Kingdom qualification. But it was, we believe, considered desirable, on the grounds of professional amenity, to recognize 'for the time being' the Harvard and Michigan qualification, as those, though falling short, made the nearest approach to our own standard, thus waiving for a time equality of qualification as between United Kingdom and foreign qualifications in favor of the applicant for registration.

"The great advances which have been made from time to time in our educational standard have rendered the inequality still more marked.

"The preliminary examination demanded by these colleges is, as may be seen from their own prospectuses, of such a nature as to fall far below the standard required from the dental students of this country, and, further, these examinations are in some instances committed to the care of individuals who have no kind of responsibility nor any claim to be considered competent for such an office.

"On these grounds we beg respectfully to suggest that the Medical Council, by virtue of the power invested in it by clause 10 of the Dentist's Act, withdraw, for the time being, the right of registration which has hitherto been accorded to the American colleges.

"TO THE GENERAL MEDICAL COUNCIL."

The following signatures were appended to this memorial: John Tomes, J. S. Turner, Morton Smale, L. J. Hutchinson, W. B. Paterson, Ashley Gibbings, William Hern, Frederick Canton, Storer Bennett, Arthur S. Underwood, Joseph Walker, T. Newland Pedley, Francis Ewbank, John Ackery, J. Howard Mummery, Sidney Spokes, Charles S. Tomes.

The Educational Committee of the Medical Council, in its final report, covers very fully the entire subject. We give the following abstract:

"There is reason to believe that *certain of the American bodies have brought themselves up to the standard of Michigan and Harvard*, and that their teaching appliances are satisfactory. From personal observation the committee have been assured of the excellence of the teaching arrangements in such centres as Baltimore and Philadelphia. It appears, therefore, to the committee that injustice is done to the American bodies whose curriculum is, to say the least, equal to those of Harvard and Michigan, by the grant of special recognition to the two last-named colleges alone." (*Italics ours.*)

The effect of the memorial and report is made evident by the following copy of an order of the General Medical Council of Great Britain, which we referred to briefly in our last number:

"GENERAL MEDICAL COUNCIL OFFICE,

"299 Oxford St., London, W., May 31, 1893.

"SIR,—By order of the General Medical Council I send you herewith a copy of a report presented to the Council by its Educational Committee, wherein the Council, at its meeting on the 29th instant, passed the following resolution:

"That the recognition of the certificates of the degrees of Doctor of Dental Medicine of the University of Harvard and Doctor of Dental Surgery of the University of Michigan by the General Council be suspended until further notice, and that the Registrar be instructed to refuse registration of such certificates."

"I am, sir,

"Yours faithfully,

"W. J. C. MILLER,

"Registrar.

"TO DEAN OF THE BALTIMORE COLLEGE OF DENTAL SURGERY."

PAN-AMERICAN MEDICAL CONGRESS.

Section on Medical Pedagogics.—The Pedagogic Section will devote its attention especially to the history of the development of medical education in America.

In the papers presented by leading teachers recent advances in methods of instruction will be considered.

The *art of teaching*, which is regarded as a study of great interest in other branches of learning, has received hitherto but little attention from the medical profession.

The Section in Medical Pedagogics will therefore be made a prominent feature of the Congress, and it is hoped that those interested in medical education will co-operate in the work of this Section by being present and by actively engaging in the discussion of subjects presented.

Any inquiries or communications may be made through the Secretaries undersigned.

J. COLLINS WARREN, M.D., Boston, Mass.,
Executive President.

CHARLES L. SCUDDER, M.D., Boston, Mass.,
English-Speaking Secretary.

WM. F. HUTCHINSON, M.D., Providence, R. I.,
Spanish-Speaking Secretary.

AMERICAN DENTAL ASSOCIATION.

THE Thirty-third Annual Session of the American Dental Association will be held in Chicago, commencing Saturday, August 12, 1893, at 10 o'clock A.M.

GEORGE H. CUSHING,
Recording Secretary.

SPECIAL NOTICE.

CHICAGO July 7, 1893.

FOR the accommodation of the different dental associations which are to meet in Chicago before the convening of the World's Columbian Dental Congress, I have secured the Kindergarten College Hall, 10 Van Buren Street, which can be used for all meetings desiring rooms.

For further information address

J. N. CROUSE,
Chairman.

NATIONAL BOARD OF DENTAL EXAMINERS.

THE National Board of Dental Examiners will meet in a room of the building occupied by the Columbian Dental Club, No. 300 Michigan Avenue, Chicago, Friday, August 11, 1893, at 10 A.M.

The attention of delegates is called to the following, passed by the National Board, August 5, 1891.

Resolved, That the various State Boards of Dental Examiners be requested each year, in season for the annual meeting, to make to the Secretary a written report of their examinations, accompanied by detailed or tabulated statements.

SOUTH CAROLINA STATE DENTAL ASSOCIATION.

THE Twenty-third Annual Meeting of the South Carolina State Dental Association, and of the State Board of Dental Examiners, will be held at Columbia, S. C., commencing on Tuesday, August 8, 1893, at 10 A.M.

NEW BY-LAWS, PAN-AMERICAN MEDICAL CONGRESS.

Languages.—By-Law IX. Papers may be read in any language, providing that authors of the same shall furnish the Secretary-General with an abstract, not exceeding six hundred words in length, in either of the official languages (English, Spanish, French, or Portuguese), by not later than July 10, 1893; and providing, further, that a copy of each such paper shall be furnished in either of the official languages, at or before the time of the meeting, to the Secretary of the Section before which the same shall be read. Remarks upon papers may be made in any language, providing that members making such remarks shall furnish a copy of the same in either of the official languages before the adjournment of the session.

Publication.—By-Law X. All papers read, either in full or by title, shall be immediately submitted for publication in the Transactions (Special Regulation 3), but authors may retain copies and publish the same at their pleasure after the adjournment of the Congress.

Constituent Organizations.—By-Law XI. All medical, dental, and pharmaceutical organizations, the titles of which have been

transmitted with approval to the Committee on Organization, or which may hereafter be transmitted with approval to the Executive Committee, by any member of the International Executive Committee, each for his own country, shall be subject to election by the Executive Committee, approved by the President, as constituent bodies of the First Pan-American Medical Congress, and each organization thus constituted shall have the right to designate as delegates all of its members attending the Congress; but no such organization shall meet at the time and place of meeting of the Congress as a distinct body; providing, that the Secretary of each such constituent body shall furnish a list of officers and a statement of the number of members of his respective organization to the Secretary-General not later than sixty (60) days before the meeting of the Congress, and shall forward a list of delegates chosen, to reach the Secretary-General before the opening of the Congress.

BY THE EXECUTIVE COMMITTEE.

February 22, 1893.

RECENT PATENTS.

FOLLOWING is a list of recent patents, reported specially for the INTERNATIONAL DENTAL JOURNAL.

492,056.—Method of Producing Dental Cement. Max Siebel, San Francisco, Cal. Filed May 17, 1892.

492,266.—Flexible Shaft for Dental Engines. Arthur W. Browne, Prince's Bay, N. Y., assignor to the S. S. White Dental Manufacturing Company, Philadelphia, Pa. Filed April 26, 1892.

492,432.—Dental Engine. Charles E. Rhone, Bellefonte, Pa. Filed May 11, 1892.

492,433.—Dental Engine. Charles E. Rhone, Bellefonte, Pa. Filed October 15, 1892.

492,434.—Dental Apparatus. Alvan S. Richmond, New York, N. Y., assignor to John S. Huyler, same place. Filed December 15, 1892.

492,830.—Dental Plugger. Arthur E. Peck, Minneapolis, Minn. Filed June 6, 1892.

493,289.—Attachment for Dental Engines. Adelbert H. Peck and Clarence E. Allshouse, Chicago, Ill. Filed November 27, 1891.

493,318.—Artificial Tooth. Joshua M. Twilley, Dover, Del. Filed January 12, 1893.

493,379.—Dental Chair. Aaron P. Gould, Canton, Ohio. Filed March 16, 1889.

493,431.—Electric Motor for Dental Work. Jeremiah Keller, Canton, Ohio. Filed June 6, 1892.

493,528.—Box for Tooth-Powder. Warren A. Spalding, New Haven, Conn. Filed July 18, 1892.

493,723.—Dental Appliance for Obtunding Nerves. William P. Horton, Jr., Cleveland, Ohio, assignor of one-half to Ansel B. Jones, same place. Filed August 18, 1892.

Trade-Marks.—22,441.—Dentifrice. William H. Farrand, Rochester, N. Y. Filed January 5, 1893. Essential feature, a representation of the Eiffel Tower.

22,542.—Dentifrice. The S. S. White Dental Manufacturing Company, Philadelphia, Pa., New York and Brooklyn, N. Y., Boston, Mass., Chicago, Ill., and Atlanta, Ga. Filed February 2, 1893. Essential feature, the word "Savonola."

22,544.—Tooth-Powder. The Reliance Manufacturing Company, New York, N. Y. Filed February 1, 1893. Essential feature, the word "Opaline."

REDUCTION OF FARES TO INTERNATIONAL MEDICAL CONGRESS, ROME, ITALY.

REDUCTION in fares to members of the International Medical Congress, to be held in Rome from September 24 to October 1, 1893.

The North German Lloyd, 2 Bowling Green, New York, offers a reduction of twenty-five per cent. to members going to and coming from the Eleventh International Medical Congress, on steamer Werra, which is to sail from New York on August 5 and September 9, and on steamer Fulda, on August 19. Both these steamers sail to Genoa. The same reduction will be made for the return trips in October and November, on the same steamers, and for the Company's Saturday (off Bremen, Sunday off Southampton) steamers.

The Hamburg-American Packet Company, 37 Broadway, New York, 125 La Salle Street, Chicago, offers a reduction of twenty-five per cent., both out and return, for all its steamers during the year 1893.

The Compagnie Générale Transatlantique, 3 Bowling Green, New York, offers the rates which are allowed French officers,—that is, \$63.50 for an \$80 accommodation and \$91.50 for a \$120 accommodation.

The Provisional Committee has made arrangements with the different companies whereby special reduced prices have been granted on the railways of the countries which the members of the Congress are to traverse.

SOUTHERN DENTAL ASSOCIATION.

THE Committee of Arrangements has secured the Kindergarten College Hall, 10 Van Buren Street, for holding the business meetings of this Association in connection with the Columbian Dental Congress. The time for the meeting is fixed for Friday, August 11, at 10 A.M.

S. N. FOSTER,
Secretary.

SPECIAL NOTICE—ASSOCIATIONS AT CHICAGO.

THE meetings of the American Dental Association and the Association of Dental Examining Boards will be held in Kindergarten College Hall, No. 10 Van Buren Street, Chicago.

J. TAFT.

ILLINOIS STATE DENTAL SOCIETY.

THE Twenty-ninth Annual Meeting of the Illinois State Dental Society was held, in conjunction with the Iowa State Dental Society, at Rock Island and Davenport, May 9-12, 1893. The following officers were elected for the ensuing year: Garrett Newkirk, Chicago, President; J. W. Cormany, Mt. Carroll, Vice-President; Louis Ottofy, Chicago, Secretary; W. A. Stevens, Chicago, Treasurer; F. H. McIntosh, Bloomington, Librarian.

LOUIS OTTOFY,
Secretary.

GEORGIA STATE DENTAL SOCIETY.

THE Twenty-fifth Annual Meeting of the Georgia State Dental Society was held at Atlanta, Georgia, May 9, 10, 11, 12. The following officers were elected for the ensuing year: President, N. A. Williams, Valdosta; First Vice-President, W. W. Hill, Washing-

ton; Second Vice-President, C. V. Rosser, Atlanta; Treasurer, H. A. Lowrance, Athens; Recording Secretary, S. H. McKee, Americus; Corresponding Secretary, O. H. McDonald, Griffin.

Examining Board.—Jno. H. Coyle, Chairman, Thomasville; D. D. Atkinson, Secretary, Brunswick; A. G. Bouton, Savannah; B. H. Catchings, Atlanta; H. H. Johnson, Macon.

Executive Committee.—H. R. Jewett, Chairman, Atlanta; — Barfield, Macon; — Hopps, Savannah; — Hanes, Cedartown; — Simmons, Guyton.

Next place of meeting, Tybee Island, Georgia, June, 1894.

O. H. McDONALD,
Corresponding Secretary.

ENTERTAINMENT OF THE MEDICAL PROFESSION AT THE WORLD'S FAIR.

At a meeting of the Joint Committee of the Chicago Medical Profession on World's Fair Entertainment, held at the Sherman House, November, 1892, the establishment of a Bureau of Information and Service was delegated, with approval and endorsement, to Charles Truax, Greene & Co., the committee reserving to itself the duty of such social entertainment of visiting physicians during the continuance of the Exposition as may seem desirable.

This action was confirmed at the final meeting of the Joint Committee, February 25, 1893, and on application of the Practitioner's Club and the South Side Medical Club, the matter of social entertainment was delegated to them, with full authority to act in the capacity of entertaining bodies, with the retention of the chairman and its American and foreign secretaries already appointed. Chairman, Dr. Charles Warrington Earle; American Secretaries, Dr. Archibald Church, Dr. George Henry Cleveland, Dr. John C. Cook, Dr. J. C. Culbertson; British, Dr. Sanger Brown; German, Dr. F. C. Hotz; French, Dr. Fernand Henrotin; Spanish, Dr. E. J. Gardiner; Italian, Dr. A. Lagario; Swedish, Dr. K. Sandberg; Canadian, Dr. R. D. McArthur; Russian, ———.

The scope and duties of the above secretaries will be designated in the future.

C. WARRINGTON EARLE,
Chairman.

THE International Dental Journal.

VOL. XIV.

SEPTEMBER, 1893.

No. 9.

Original Communications.¹

AFFECTIONS OF THE TEETH.

BY C. N. PEIRCE, D.D.S.

THE study of the diseases of the teeth is not of recent origin, but, though of great antiquity, there is still much that remains unwritten which may be suggestive, if not in itself of great value.

The history of dental anomalies and their treatment is almost as old as the history of medicine, and, like the latter, has had its periods of superstition and of mysticism.

To-day, with all the boasted progress dentistry has made in common with other specialties in the healing art, it is in its therapeutic literature, with the exception of publications on bacteriology, but little more than an enumeration, a record, of anomalies and methods of treatment. How and whence these anomalies arose are questions which receive scarcely a respectful consideration. Dental meetings are held and, at these, well prepared papers are read and discussed, but devotion to certain morbid and pathological conditions, with suggestion of remedies, treatment, and manipulative processes, is largely the limitation. This is all, doubtless, very profitable, but does it occur to the reader that it has but little interest or significance save to the specialist?

A new method of treating an abscess, cleansing, enlarging, and

¹ The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

filling a root-canal or a crown cavity, describing the location and the progress of decay and manner of arresting it, inserting a crown or a complete denture, may all be financially successful, but is this narration, even though the methods be novel, the most that can be done towards a contribution to the science of dentistry or to dental therapeutics?

Nature is rich in anomalies, both the flora and fauna are giving countless examples, but does the scientist, who is ever watchful of these, rest satisfied with a record of what he sees? Does he not rather endeavor to step behind the curtain to look for the cause? The phenomenon is, or should be, but preliminary to greater efforts and profounder thoughts. The numerous pathological conditions which affect the teeth in different and diverse individuals make them objects of deep interest and solicitation, but the remarkable, the universal similarity which is recognized in these abnormalities, in their appearance, their progress and termination, renders their appropriate and comparatively successful treatment quite possible within the range of limited skill and mediocre professional attainments. It is unfortunate that the majority of the dental profession are interested only in these anomalous conditions and routine treatment, which is soon fixed within a very limited area, and necessarily so, because the recorded phenomena are, as just stated, so marvellously similar. The inquiry it is desired to stimulate in this paper is, How or whence do these arise, and why so similar in their appearance, frequency, and influence? We are all familiar with the fact that anomalies may make their appearance in the organism of the body without being pathological in effect,—for an example, the absence of a tooth or the reverse, a tooth in addition to the normal number; though disease itself is always an anomaly.

Variations in structure, which come in response to physiological conditions or changes, and also in adaptation to environment, are often in the line of higher development, but are in no sense pathological. It is only when the anomaly impairs the organ's or organism's functions, deteriorates and debases its vigor and shortens its life, that it can be regarded as disease. Symptoms or structural vices are frequently recognized; these are without hesitation said to be the effects, the results, or signs of a series of reactions, and constitute the process. The nearer we can trace this to its inception, the nearer we come to the primary cause or causes, and to the essence of the disease itself.

“Every change recognized in living structures, whether normal or abnormal, is the resultant of forces, incident and inherent, forces

from outside as well as from within." "If these are so adjusted or co-ordinated as to preserve the integrity of the part, the result is health, and if sustained not only to the extent of overcoming waste, but in excess of the demand, then growth and development are promoted." "It is this capacity of the organism to appropriate power from external sources that gives life its most distinctive characteristics." When through deteriorated vigor the organism loses this ability, and the inherent power of co-ordination and adaptation is unable to withstand the external disturbing forces, disintegration, disease, and death result. "While integration or growth is the normal end and purpose of vital action, it does not necessarily follow that disintegration or atrophy is abnormal and morbid."

The conflict of forces is never ceasing, there is never equilibrium, never rest; the only living existence of which we are cognizant is in a perpetual struggle. The greater activity of the nutritive processes is in the young and growing being, while as maturity or old age are reached there is a gradual decline, "disintegration being always conditioned by the laws governing integration." "Disease is not an entity, its exciting, its active motive may come from some entity without, but the cause which is most essential and for which we should seek is inherent."

The destroyer whom we would pursue is not an external agent which can be seen and handled, but an element of disorder in the organism itself. The inherent susceptibility of the tissues as a factor in disease is one to which little attention is given in this age of microscopic investigation, the parasitic germ being now held to be the great criminal, the all-important agent; and in consequence of this the part played by a defective organ or organism is amazingly overlooked. All the blame is cast on this poor little bacillus, while the lurking vice in the tissues goes without notice. That the bacillus tuberculosis is the exciting cause in phthisis seems to be well established, but that it may be and is taken into thousands of lungs with perfect impunity is also a well-recognized fact. Before this micro-organism can locate and cause suppurative processes there must be, by acquirement or hereditary predisposition, a soil favorable to its pabulum and habitat.

Dr. Edward Bennett Bronson, to whose article on the origin of types in disease the writer is indebted for much in this paper, says, "The inherent susceptibility of the tissues is a factor in disease to which insufficient attention is given. Every disease rests on a tripod of factors,—to wit, first the primary injury representing the incident force; second, the susceptibility of the part, which stands

for the inherent and resisting force; and third, the pathological effect, which is the resultant. To ignore any one of these factors leaves a very unstable basis for pathological study, and however true may be the conclusions arrived at, it stops short of the whole truth."

The same author draws the following conclusion, and the reader will see that it is just as applicable to the dental as to other tissues. Susceptibilities to disease having their origin in defects of development, and seldom peculiar to the individual, but occurring in greater or less degree in the same form throughout a large portion of the human family, are largely accountable for the typical characters which most diseases assume; and again, the susceptibility to disease is never constant. It is ever shifting with the stage of development or with the age of the individual. The weak points differ at different periods of life, and at different phases or periods of development.

Another matter of interest and worthy of a few words of inquiry is regarding the value of advice so frequently given by the dentist to his patients respecting diet, advising not infrequently that certain elements or kinds of food, if persisted in, will improve the dental tissues by furnishing the essentials of tooth-structure. Let us for a moment look at the changes which all foods undergo, and see how much encouragement we can gather to sustain this hopeful theory. From the nutritive materials in the blood protoplasm is formed in all the tissues of the body, so that the characteristic elements and products of these tissues must be the result of the constructive changes of this nutritious matter, and in each organ or tissue of the body the protoplasm appears to have special endowments adapted to their specific functions. In illustration, the cells of the glandular organs, such as the salivary glands, the liver, the pancreas, the mammary glands, etc., as well as all the tissues, with their characteristic structural elements, must all be considered as the resulting products of the changing nutritive material. In plant growth the food elements are built up into protoplasm before they are converted into the constituents of plant tissues, such as albumins, starch, fats, etc. So in animal nutrition these same albumins, albuminoids, fats, and carbohydrates must all pass through the preparative stages of blood before they can enter into the composition of the different tissues of the animal body. To trace any specific relation of particular tissues to special food constituents seems out of the question.

In discussing the economics of foods and diets, Dr. Manly Miles

says, "If we keep in mind the significant facts *that vital activities direct and determine the transformations of energy and the collocations of matter in plants and animals, in accordance with the nutritive requirements of every organ and tissue, and that in the higher animals the food supplies of the various tissues that differ so widely in composition and function are derived from the same common pabulum, the blood, which, under the varying conditions of supply and demand, maintains a comparatively uniform composition, the futility of assigning to each or any element of the food a specific rôle in the processes of nutrition must be obvious.*" (Italics are the writer's.)

With the demonstration of one other idea this paper shall close, —to wit, the influence of function or use upon the development of structure; its quality, quantity, and conformation, subjected to modification through this factor.

A well-recognized fact in zoology is the degeneracy which takes place in animals after they become parasitic in their habits. In early life some move about freely with complex organs of locomotion, but when fastened upon or within the animal from which they obtain their subsequent support, organs of special sense as well as of movement are lost. Note also the change which takes place in the eyes of fishes living at great depths in the water, or those swimming after maturity entirely upon one side, as the flat fish, which in early life has its eyes on opposite sides of the head, the submerged eye gradually changing its position until both are looking upward from the same side in response to demands of vision and the animal's protection. If the intelligent oculist or ophthalmologist is consulted, he will tell us that all animals, all savage and uncivilized peoples, all civilized babies, are far-sighted. "The majority of civilized people," says Dr. George M. Gould, "are also hyperopic. Suddenly comes civilization, and within a century, printing, reading, writing, schools, and in-door life are demanding constant use of the eye upon objects within a foot or two, and keeping the ciliary muscle in a state of abnormal continuous tension. The habits and structures of millions of years' formation are in a few years forced to do a work of a very different and straining sort. What is the result? We see, or ought to see, on three-fourths of the civilized portion of the human family some instrument for adapting the vision to this new condition. Nature has been given no time to make the change. One of the unfortunate facts in this eye-strain is that the eye itself frequently does not complain, and is much less conscious of discomfort than other

organs, but during all this time the abnormal condition is establishing a group of reflex ocular neuroses, which, though not destroying life, are making it a burden. This wonderful demand which is recognized as being made upon the organs of vision with all its train of pathological results must certainly throw some light upon the manifold abnormal conditions to which the organs of mastication are subjected. Is it possible that one can practise dentistry for twenty, thirty, or forty years without recognizing, first, the great similarity existing between the pathological conditions which he meets in his hundreds of patients; and, noting this fact, must he not be led to the unmistakable conclusion that the important factor behind it all must belong rather to the race, the nation, than the individual? How much less are the dental organs subjected to the influences of civilization than the organs of vision?

The change from uncooked to cooked meats, from fruits and roots to vegetables cooked and the multiplicity of dishes prepared, not only to satisfy man's appetite but to propitiate the palate and stimulate its demands, this must certainly constitute a factor not to be overlooked, and one that must have its influence in modifying those vital activities which direct and determine the transformations of energy and the collocations of matter in accordance with the nutritive requirements of every organ and tissue.

SOME OF THE PROPERTIES OF HYDROGEN PEROXIDE SOLUTIONS.¹

BY HENRY P. TALBOT, PH.D.²

THERE has been in recent years a marked decrease in the use of the solution of hydrogen peroxide as a detergent and aid in the removal of diseased tissue, and the peroxide itself has fallen into disrepute as a result of the failures attending the use of commercial solutions by dental practitioners. But it is an open question whether this fate is not rather deserved by those who have claimed to furnish the market with a reliable article than by the peroxide itself.

At the suggestion of some of the members of your Society I have undertaken to appear in defence of the peroxide,—at least so

¹ Read before the Harvard Odontological Society, April 27, 1893.

² Massachusetts Institute of Technology.

far as chemical evidence is concerned,—to make some statements regarding the nature of our commercial solutions, and to show what the chemical properties of properly-prepared solutions of this useful reagent really are. The subject will be treated from a chemical stand-point chiefly.

Hydrogen peroxide is represented chemically by the symbol H_2O_2 ; that is, its molecule is composed of two atoms each of hydrogen and oxygen. The similarity of this molecule to that of water, H_2O , is at once apparent, and has led to the application of the name “oxygenated water” to the compound, a title which is misleading, as is indicated by the publication of erroneous statements based upon the assumption that the solutions of hydrogen peroxide are merely water charged with oxygen or ozone. Such is not the case. The hydrogen peroxide exists in solution in the water in the same way as common salt in a brine.

The best of our knowledge at present leads us to assume that within the molecule of the peroxide the two oxygen atoms are joined together, and that each has a hydrogen atom attached to it, thus, H—O—O—H . This intermolecular arrangement is one which frequently results in the production of unstable compounds, to which class the hydrogen peroxide belongs. Indeed, it is this very lack of stability which constitutes the valuable property of the peroxide, inasmuch as it leads to a ready decomposition into water and oxygen; $2\text{H}_2\text{O}_2 = 2\text{H}_2\text{O} + \text{O}_2$. The higher oxide (H_2O_2) breaks up into the lower oxide (H_2O) and oxygen gas (O_2), the latter being liberated. This oxygen is, at the moment of its liberation, nascent oxygen, or oxygen in its state of greatest efficiency. In this connection a word or two regarding our conceptions of the difference between nascent oxygen and gaseous oxygen may be of interest. Gaseous oxygen is made up of great numbers of oxygen molecules, and these molecules in turn are made up of oxygen atoms. We have reason to believe that there are two oxygen atoms in each molecule. Before a molecule of oxygen can become chemically active, the parts must be torn asunder; that is, the atoms must first be separated before they react. This requires a certain amount of energy, and the energy thus consumed lessens that of the chemical action. But at the moment of liberation from the hydrogen peroxide the oxygen is in its atomic or nascent state. The liberated atom has not yet entered into combination with any other atom to form a molecule; it is in its nascent condition, and at that instant it is ready to display its greatest chemical activity, since no energy is to be expended in tearing apart the molecule as indicated above.

Fortunately, simple contact with diseased or dead tissue is sufficient to cause decomposition of the hydrogen peroxide, and the nascent oxygen liberated at once attacks and destroys the waste material. The process is identical in its nature with that of combustion.

The peroxide works in a friendly spirit, for while the waste material is promptly attacked, the healthy tissue is acted upon slightly, or not at all. This may be easily seen by placing a drop of the solution upon the skin and observing the evolution of oxygen resulting from the action of the peroxide upon the waste material which is always present.

The intensity of the action depends upon the concentration of the solutions employed, and if the more concentrated solutions to which reference will be made are used, the results are twofold. In the first place, the diseased tissue is attacked, and the mechanical removal either completely accomplished or at least facilitated, while, in the second place, the solution acts as a germicide. The germicidal action takes place, too, under the most favorable conditions,—namely, not merely on the surface, but within the coating, a point of much importance. Reference will be made to this again.

Among the properties of hydrogen peroxide which make it of special value to the dental and medical profession should be mentioned its non-poisonous character and the harmless nature of its decomposition products, oxygen and water. In this respect it is distinctly preferable to corrosive sublimate, carbolic acid, and the like.

Unfortunately, the hydrogen peroxide does not always wait for the presence of oxidizable substances before undergoing decomposition. Spontaneous decomposition takes place slowly, to which is due, in a large measure, the poor quality of the solutions to be found in the market. But there is a generally mistaken notion abroad that this deterioration is so rapid as to render the preservation of solutions practically an impossibility. This is not so. A little care, and a knowledge of the conditions which tend to cause decomposition, will enable dealers to keep a small stock on hand in fair condition for some time. These solutions cannot, however, be treated as the majority of other preparations are treated, and must not be kept for a long period in stock, particularly during the summer months. Undoubtedly freshly-prepared solutions would be kept on hand and sold if a demand were always made for strictly first-class preparations. There is, unfortunately, no easy and reliable chemical method which dentists can use to test the value of solutions offered. They are obliged to judge from their practical efficiency.

The commercial solutions of the peroxide should range from eighteen to twenty-three volumes. In point of fact, I have found them to vary from four to twenty-three volumes. On four occasions I have found solutions, sold in this city for eighteen-volume solutions, which were actually less than ten volumes, two of them four volumes each. Inasmuch as such solutions are little, if any, better than an equal quantity of water, it is not strange that dentists, into whose hands such solutions may come fail to obtain satisfaction from their use, and denounce the remedy as a whole.

Other remedies are subject to the same variations in value as the hydrogen peroxide. Some of these have come under my notice, and the results of my examination of several medicinal preparations lead me to suggest that it is not safe to depend upon the quality of the reagents purchased in the market to-day, and failure to attain expected or predicted results is not always to be attributed to misstatements on the part of the founder of a new method of treatment, but the cause is often to be sought in the quality of the article offered for sale by the druggist or other dealer in supplies.

There are two systems in common use to express the value of hydrogen peroxide solutions. The American custom designates as a twenty-volume solution one which, when brought into contact with a substance which will give up an atom of oxygen to unite with each atom furnished by the peroxide; will evolve twenty times its own volume of oxygen gas. Potassium permanganate is a representative of the class of substances referred to, and one cubic centimetre of a peroxide solution, when poured into an acid solution of the permanganate, should evolve twenty cubic centimetres of oxygen to accord with the American definition of a twenty-volume solution. The English custom requires that one cubic centimetre of a solution shall, of itself alone, by decomposition, yield twenty cubic centimetres of oxygen in order to be designated as a twenty-volume solution. It is obvious that the second solution is twice as strong as the first. As Dr. F. H. Williams points out in a recent number of the *Boston Medical and Surgical Journal*,¹ much confusion would be avoided by the use of percentages to express the amount of peroxide present in the solutions. A twenty-volume solution (American system) corresponds to about three per cent. by weight; a fifty-volume solution to 6.9 per cent.²

¹ Vol. cxxvii. p. 303.

² This system has recently been adopted by the manufacturers of the so-called "pyrozone" solutions.

It has already been stated that the energy of the action of the peroxide is greater the greater the concentration. It is of advantage to be able to accomplish much with a small quantity of the solution, and for such cases solutions of greater strength than the commercial solutions may be employed with success. Moreover, it appears that the germicidal action of the peroxide is not vigorous until the concentration has reached about fifty volumes. The only data available regarding the germicidal power of hydrogen peroxide are those published by Dr. Williams in the paper already referred to, where he describes the application in cases of diphtheria, in which the part played by the peroxide is, in a general way, similar to its rôle in dentistry. From the experiments quoted it appears that a strength of fifty volumes is required before the germicidal action is prompt and complete.¹

It is perfectly possible to prepare solutions which will evolve three hundred volumes, or over, of oxygen, and fifty-volume solutions may be kept in stock for short periods without appreciable deterioration. The cost of such solutions is necessarily greater in proportion than the commercial preparations, owing to loss incidental to their manufacture, and the difficulty in maintaining them at their proper strength. The increased cost would be, I imagine, a minor consideration, if the remedy proved to be satisfactory in itself.

The concentration is accomplished by distillation at reduced pressure, and the maximum strength reached in my experiments was five hundred and eighty volumes. If the pressure is reduced to thirty millimetres of mercury, the loss during concentration is small. A small amount of the peroxide distils over with the water, the greater portion remaining in the distilling flask.

The commercial solutions have been found to contain some or all of the following impurities in small amounts: sulphuric, phosphoric, hydrochloric, and hydrofluosilicic acids, iron, aluminum, magnesium, barium, sugar, and glycerin. Of these impurities, the bases and hydrofluosilicic acid may be removed by a procedure the details of which would be out of place in this paper. The sugar, glycerin, and sulphuric or hydrochloric acid are, when present, added as preservatives. The phosphoric and hydrofluosilicic acids (and sometimes the sulphuric and hydrochloric acids)

¹ Recent experiments show that there is some reason for thinking that the germicidal power of peroxide solutions lies in the acid present, and not in the peroxide. This is important when it is considered that for other reasons a *neutral* solution is desirable.

are employed in the manufacture of the hydrogen peroxide from barium peroxide.

The acidity of the commercial solutions varies from 0.2 per cent. to 0.6 per cent. by weight, expressed in terms of sulphuric acid, and is a combination of all the acids present. In the purified and concentrated solution the amount of free acid may be much reduced. The greater the purity of the solutions the less acid is required to preserve them, and for a fifty-volume solution the amount required need not exceed 0.5 per cent., an amount insignificant in comparison with aromatic sulphuric acid, which is employed for purposes similar to that for which the peroxide is used.

The question naturally arises, if one cannot depend upon finding twenty-volume solutions in the trade which are of full value, what hope is there of finding fifty-volume solutions which are reliable? In this connection the following figures are presented, taken from a large number of instances which have come under my notice.

NATURE OF SOLUTION.	Acidity in terms of H_2SO_4 .	Original Strength.	Time of Standing.	Temperature.	Final Strength.	Per cent. loss.
	Per cent.	Vols.	Days.			
Commercial solution	0.2	19.4	3	70°-80° F.	19.4	0.0
			7	70°-80° F.	19.2	1.0
			13	70°-80° F.	19.2	1.0
Commercial solution (repeatedly agitated)	Approx. 0.2	23.0	60	70° F.	20.0	13.0
Commercial solution, concentrated at reduced pressure	0.5	44.6	3	70°-80° F.	44.6	0.0
			7	70°-80° F.	43.5	2.4
			13	70°-80° F.	43.0	3.6
			42	70°-80° F.	40.4	9.4
			128	70°-80° F.	27.9	37.4
Commercial solution, concentrated at reduced pressure	0.9	99.4	3	70°-80° F.	100.0	0.0
			17		82.7	16.8
			24		76.0	23.4
Commercial solution, concentrated at reduced pressure	0.9	100.0	3	32° F.	99.4	0.6
			16	32° F.	98.6	1.4
			24	32° F.	95.0	5.0

The figures show conclusively that it is possible to preserve even concentrated solutions for days or weeks without materially impairing their efficiency for dental purposes. It is obviously impossible for dealers to keep the concentrated solutions in stock for long periods, but if demand were made for solutions which were guaranteed to be freshly prepared, there is no satisfactory reason why the demand should not be supplied. It is also evident from the figures presented that the lower temperatures tend to increase

the stability of the solutions, as does also protection from sunlight, dust, and mechanical agitation.

That the stronger solutions (fifty-volume or one-hundred-volume) may be employed without danger is shown by the fact that the strength has been increased to three hundred volumes in the treatment of certain cases of diphtheria without harmful effect upon the sound tissue.

All solutions, even the twenty-volume, produce white blotches if left for some time in contact with the skin, but these soon disappear. The more concentrated solutions frequently produce, also, a stinging sensation, lasting for few moments only, and causing no permanent discomfort.

The hydrogen peroxide is readily decomposed by contact with metallic surfaces, which renders its use in or with metallic instruments inadvisable.

In summarizing, it may be said that much of the lack of success attending the use of hydrogen peroxide has been due to the poor quality of the solutions obtainable; that the commercial solution, when of good quality, is serviceable as a cleansing agent, but that solutions of fifty-volume strength are much more efficient as detergents, and that such solutions may be preserved for a period of twenty to thirty days without losing their practical efficiency if moderate precautions are observed.

Since the preparation of this paper I have had occasion to examine two new brands hydrogen peroxide, the so-called pyrozone solution and that offered by the Oakland Chemical Company. The results may not be without interest, and, concerning the aqueous solutions, are briefly as follows: The acidity of these solutions has been reduced to about 0.06 per cent., which is practically neutral. On some grounds this is an advantage, but, as has already been intimated, it seems probable that the germicidal value is lessened.

The amount of impurity is very small.

It is an interesting fact that these solutions may be concentrated by careful evaporation in an open dish. In this way it is easy to obtain a fifty-volume solution, and it is possible to obtain two-hundred volume solutions with some sacrifice of material, but still in sufficient quantity to use in an emergency.

The hydrogen peroxide is easily soluble in ether, and the so-called five-per-cent. and twenty-five-per-cent. pyrozone solutions are ethereal. They are practically neutral.

If kept in ordinary glass-stoppered bottles, these solutions show

an increase in strength, caused by the escape of the ether. This counterbalances any decomposition of the peroxide.

Experiments show that these ethereal solutions leave, on evaporation, a very concentrated solution of the peroxide in the small quantity of water which is always present. This residual solution is very caustic in its action even upon sound tissue.

There appears to be reason for supposing that the neutral aqueous solutions referred to above will retain their strength for a longer time than those mentioned in the table already quoted. The writer has as yet no positive data bearing upon this point.

AN ABNORMAL POSITION OF A LEFT CENTRAL.

BY W. IRVING THAYER, M.D., D.D.S., WILLIAMSBURG, MASS.

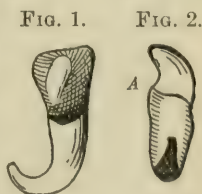
EARLY in July, 1893, while paying a visit to a well-known dentist in New York, I was invited into his operating-room in consultation upon a mal-positioned left central.

The lady, Mrs. M., aged about forty-five, had been the patient of E. Parmly Brown, D.D.S., from girlhood to that time. I found the left central had from some cause turned end for end, so that the crown pointed upward and was quite visible in the left nostril.

It will be seen by reference to the cuts that Fig. 2, which is a left lateral view, shows the crown to have a squatty appearance, a hump-back look, showing, in the opinion of the writer, a *double compression* in its formative or embryonic life that first curved the root at a spot in this tooth having the least resistance, and when calcareous deposits had gathered in greater quantity in the alveolar tissue to support the apical end, then the crown must needs "hump-back" itself, being largely composed of soft solids because it had not at this time received a normal supply of the necessary calcareous salts.

The lateral plain view shows—Fig. 2—the tooth to be a little shorter in outside lines than in the labial aspect.

In Fig. 1 the curve was to the left. At A, Fig. 2, it will be observed that the major portion of the palatine surface is disintegrated with a dry, absorbed condition of the soft solids, seemingly leaving the lime salts in position, described as dry rot.



It is important to state that the right central and lateral and left lateral were erupted in normal position. Again, there had never been any appearance of supernumerary teeth.

Where did the crowding come from?

The tooth was extracted from the left nostril by Dr. Brown, *without the least pain* to Mrs. M., by the topical application of anæsthesia-obtundent number two. It was a mere accident that the writer was present at the time. The lady had for many years desired to have the annoying tooth removed, but would not consent to take chloroform, ether, or nitrous oxide. She finally consented to the use of this anæsthetic after being assured that with it the operation could be made painless.

There are many interesting and instructive points in this case; but who is wise enough to inform the reader why this tooth erupted into the left nostril? What force sent it skyward? What influences were at work to make a fish-hook out of the root and a hump-back of the crown?

Mrs. M. had a cleft palate, so that the writer, who applied number two, made four swabs so curved that he could reach in back of the opening, upward and forward, and obtund in this direction, as well as more direct applications to all portions of the anterior nares and gums.

When a certain able gentleman saw the original tooth, and was informed of the "cleft," he said, "Oh, that tells the story of the end-for-end position of the tooth as well as its other crooked conditions. There was no room in front for this tooth to come down naturally, and it must needs go somewhere, so it developed upward. Cleft-palate cases are narrowed arches."

It is a good thing to be wise, but for some reason nature failed to contract Mrs. M.'s upper maxillary.

But what turned that left central completely around? This Dr. Brown or the writer failed to discover. It was not for lack of room, nor a gradual contraction of the arch as age advanced, for the "cleft" did not reach quite up to the rugæ, so that there was vault enough to prevent a doubling-up of the centre at median line.

A lower acute-angled alveolar forceps was used in extraction. There was a large flow of blood, and much joy expressed by the patient to be relieved of her burden in so satisfactory a manner.

The writer is unable to find any other case recorded of the removal of a tooth through the nostril. He knows of a root being extracted from a cadaver, but not from a patient. The upper lip

was perfectly formed. The anæsthesia was so complete that a tumor could have been removed in addition to that of the tooth. There was much previous local inflammation, which was stimulated to such an extent by the anæsthetic that the parts took on almost immediately a healthy condition.

RIGGS'S DISEASE—WHAT IS IT, AND CAN IT BE CURED?

BY DR. G. A. MILLS, NEW YORK.

SOME thirty years have elapsed since Dr. Riggs made known his views concerning prevalent disordered conditions of the teeth and their surrounding tissues, and his mode of dealing with them. It would be a waste of time to discuss the general notice and attention given to this before Dr. Riggs gave expression to his views.

This was the common remark, "It is evidence of senility that such conditions are made possible, and there is no remedy." If it had been said that these disordered conditions evidenced an atrophy or hypertrophy then there might have come the thought of a rationale, for the term senility was only applied to advanced years. It cannot be admitted for a moment that no such disordered conditions could be found among the middle or even those nearer the senile period. Loosening and falling out of teeth were confined mostly to the advanced stage of the disorder; the earlier manifestations did not attract the attention now given them.

When Dr. Riggs first began his teachings, he spoke by the light he then possessed, and that is all any one can do. His light was far in advance of those who had spoken before him. The views expressed were at once regarded as not only new but novel.

Dr. Riggs had the advantage of the light of genius, fortified by a classical education. Genius has the virtue of integrity coupled with this light; they are gifts; keep them harnessed together and that which is derived from observation and experience will be the truth. With such helpers the doctor applied his observations to these generally neglected conditions, and found that there was a disease located about the sockets of the teeth, resulting in pus discharges, loosening of the teeth, and ultimately a loss of attachment of surrounding tissues, falling out of the teeth, and more often than otherwise he found a calcareous deposit, popularly known as tartar.

He was led to go farther in his operations, that he might find the existing cause, at least, of the pus present. Further research was made for tracing out the source of this, that either recommenced after the partial treatment or might have still continued to flow. Patient labor revealed the fact that the alveolus had become a participant of the inflammatory parts, wasted frequently in portions, and sometimes as a whole.

Further attention revealed another fact, that the edge of this bone was in a state of partial necrosis. Having the knowledge of surgical principles, he simply applied them. These are well known to all surgeons,—“cut or trim back of the life-line and secure a healthy reaction.” Practice proved this in so large a percentage that it is not much of a marvel that the doctor felt that he had discovered something that could become a blessing. Herein lies the merit of the Riggs treatment, emphasized by the unquestioned intelligence of two witnesses,—viz., the late Dr. W. H. Atkinson, of New York, and also Professor Garretson, of Philadelphia.

For several years Dr. Riggs continued to follow out the results of his discovery, for it truly was one. If he had been of the nature of Atkinson, following his inspirations, the world would have had the benefits sooner. Although it has come slowly to our ears, it has proved that “slow growth is sure.” I have said that Dr. Riggs followed the light he had. If we have done as well, then well.

Dr. Riggs only gave us one published article. This can be found in the extinct publication, the *Pennsylvania Dental Journal*. It was copied in the *Dental Miscellanies*. I think this article can be found in the numbers of 1877. That this subject has not been understood is shown by reference to our literature. Very few have become proficient in dealing with this disorder by the method taught by the originator.

It is true that he committed himself to the theory that tartar was the cause,—I would say the exciting cause,—and too many have followed in his thought, and have taken narrow views of the disorder because of this, and have tried to confine his labors to a very limited field, separating salivary deposits from manifestations following the hidden accretions, and neglecting the disordered edge of the alveolus.

This is only an evidence that they have listened with their ears but have failed to understand the teachings. I am safe in this statement, for many have put themselves on record proving the truth of the assertion. The larger proportion of men who have given expressions of their views have ignored the merits of Dr. Riggs's

treatment. The mass of instruments that have been put on the market prove it by their forms.

I trust I have now made myself clear what this disease means from a practical stand-point and as announced by Dr. Riggs. It will be noticed that I adhere to the term "Riggs's disease;" this is only to keep the association for a time longer, while the settlement shall be made upon the most intelligent term better expressing the real meaning.

This term did not originate with Dr. Riggs or myself, but with the Connecticut Valley Dental Association. This may appease some. I will add this question: Is it true or not that it is essential that this disorder must be met successfully by observing the merits of the Riggs treatment,—trimming the disordered edge of the alveolus? This is the point at issue. From a large observation I am convinced that ninety-five per cent. are dealing with this disease apart from the recognition of this claimed merit. Many, a great many, are not observing even the necessity of anything but local dressings; no surgical instruments of any form are used. What does this prove? Just this, the "partial culture" of our calling. It also proves another thing,—that the intelligence has not dawned upon these minds that this disorder has its origin outside of the local conditions; a lack of knowledge to discern the undeniable evidences that this lesion is of constitutional origin. Do many who deny this fact realize that the statements that are so freely and fulsomely made in every direction that you cannot cure pyorrhœa is a proof that it is of constitutional origin.

I can only, from a common-sense view, deny that pyorrhœa is a disease. It is an adjective when used in connection with alveolaris. And if it did express the meaning of a disorder, it is far from covering the range of its destruction in its application to the waste of gum and other tissues that are the normal support of the teeth.

Dr. Rehwinkel admitted to me that this term did not give satisfaction to him. I have always contended against it.

Can Riggs's disease be cured?

If I have made myself intelligent, it will be readily seen that so far as constitutional phases are evidenced in the large majority of cases I can but answer the interrogation in the negative.

No mortal man has the power to cure a disease any more than he can original sin. It can only be arrested or checked by surgical or local treatment, and held in check by constitutional remedies.

Dr. Riggs classed the degrees of progress by numbers 1, 2, 3, 4; this meant to him that number one indicated the beginning, or

what I have termed in all my writings and sayings the incipient condition, and number four would mean the last stage (too late), with which the practitioner is often confronted, for the reason, first, that too frequently these incipient conditions were not recognized. Here a question stares the dentist in the face, Who is to blame for this "too late" stage? Who has been living in darkness in these days of much light? If we assert that this disorder cannot be cured, then what have we to say for all our earnest and zealous labors since 1874? It is this, that intelligence will accomplish much, and if you are able to appreciate the helps offered, you will find after an accumulation of practical experience that you have a stock in trade that will make you effectual in dealing with the needs of your patients. No one thing is so much needed in this day as post-graduate teachings in connection with such a vastly important branch of practice, and one that can be made so fertile with pre-eminent and helpful service for the people. We are in the age of needed demonstration. Our schools are turning out far too many inefficient practitioners that must of necessity prey upon an ignorant public. Our acquirements must be carried upon a higher plane if we are to be just to our patients. Many grave questions are looking in our face. Some one, perhaps more than one, will ask, Will we give a *résumé* of our nearly eighteen years' practical experience with this disorder? This can be done with but little effect except by clinical demonstration, case after case. Some will possibly say that this is a disorder which cannot be cured.

What is the encouragement? Not a few laymen are asking the same question. One, yesterday, an intelligent lawyer, came in for counsel. He had had his case treated for pyorrhœa with aromatic sulphuric acid by an M.D. dentist. The parts are full of pus again, after a few months' treatment. He asked, "Is there any such disease as pyorrhœa?" He was told plainly and decidedly that there was not, and then was given an intelligent statement of facts. He followed by asking another question: "If it cannot be cured, then why not have the teeth extracted?" I said to him, "The people that seek my service are desirous of trying to keep their teeth. I am doing what an intelligent practitioner can to give you the advantage of that which has been gained by years of earnest special practice." There is no nobler nor more humane field of labor to which one can devote himself as a special life-work. The field for this is immense, and there are yet very few who are able to meet the demands. It has not been specialized to any extent, but is largely generalized with very weak dealing. Teeth

cannot be saved, except in a minimum percentage of cases, without giving them the best possible surroundings of health.

The practitioner, to meet this demand, must be able to labor in this field with such a degree of culture that the medical practitioner will be compelled to surrender to the superior skill. What men are best fitted to do by nature's endowments should receive special education for special service. This must and will come, for such a skill will ultimately receive a compensation worthy of its hire. Nothing is more true than, as Professor Taft said at one of the late meetings of our profession, "When you undertake to deal with one of these cases of pyorrhœa you must look at the bodily conditions, and find out what you have to enable you to hold the benefits secured by surgical dealings and constitutional treatment." I have given the substance of his remarks. I could detail case after case, but give one where, during the last year and a half, it has been almost entirely dealt with by constitutional remedies.

There were no "calcic" deposits, as Professor Peirce terms them, but decided portions of necrosed bone, and most of the teeth hanging loosely. I had, unexpectedly, an opportunity of showing this case to four dentists, and was asked what I expected to accomplish. I replied, "I don't know, for I never had a case with such peculiar complications of bodily ailments and the patient as young,"—only about thirty years of age. It is a case of interest now, and is, in the main, a success,—not complete in all things, but enough so to feel joyful over, considering the painful condition of the teeth and surrounding tissues and also the wrecked physical organization, coupled with serious mental complications. I did not intend to give a *résumé* of my treatment, but have presented the subject as I have, hoping to stir a larger intellectual thought upon a matter that is worthy.

CELL METAMORPHOSIS.¹

BY P. T. SMITH, D.D.S., DENVER, COL.

CELL-GROWTH is recognizable in all vegetable and animal organisms, there being as many different kinds of cells as there are specific or even intimated characteristics in the body.

The primary inception of a living body is but a single cell, fertilized.

¹ Read before the Colorado State Dental Association, June 7, 1893.

The myriad of elements that enter into the composition of a primate cell and reflect substantial evidence of their existence and power in the ultimate, do so by means of a specific class of cells,—each of a determinate idiom, and which proliferate from the parent cell. To follow the cell quality throughout the differentiation necessary to crystallize and personate each factor of the whole organism would create a volume. Hence I can but hint at some salient ideas bearing upon the functions and metamorphoses of some of those most familiar.

Commonly, as we understand it, cells are primarily created out of protoplasm, and consist of a body, nucleus, and nucleolus. This analysis will not sufficiently account for the heredity or transmission of parental idiosyncrasies which involve phenomena of much importance to the pathologist.

Germ-plasm differs from protoplasm in being active, while the latter is a passive substance and a cell-culture susceptible of inhibition in the growth and division of the nucleus, and endowed with biophors under control of the determinates or ids of Weismann, or gemmules of Darwin. These substances are alone formed in the nucleolus; the ids or gemmules controlled by the determinates, and in the exhibition of sperm-plasm fertilizing the ova-plasm, there comes from every department of the paternal and maternal source of authority a biophore or id which bears the nature of its origin to the new objective independent, impressing the new being with mental and physical likeness of its combined parental origin.

These functions, with the associated ones of sensation and movement, are connected in all organisms with which we are familiar, from the simplest univalvular forms to the highest plants and animals, with at least two different substances: the idioplasm of the nucleus, or the hereditary-plasm in the more general sense, and protoplasm of the cell-body. These two differ as regards their functions, though they resemble each other in being composed of living substance.

Nageli's example is acceptable in calling the vital substance of the cell the "formative plasm or morphoplasm" in contrast to the idioplasm. The latter is the active element in the process of formation, and the former the passive one. As we now believe that the idioplasm is situated in the nuclei only, we cannot regard the cell-bodies which determine the form of all parts of the organism as mere nutrient plasm.

The germ-plasm contains the primary constituents of all the cells in the body in its determinants, which, in their highly-endowed

susceptibility, are subject to the varied controlling influences reflected from compatible as well as incongruous and degenerate sources, such as parental predominance in mental and physical inhibition as well as extraneous involutionary nutrients,—*i.e.*, vital currents, food, air, and water.

Cells composed of physiological elements, designed by the chemical proportions for specific functional service, will evolve a faithful reflex of the combined parental image setting forth each individuality of the minutest architecture, faithful in the most scrupulous degree. This is recognizable only under highly favorable conditions in the complicated phenomena of ontogeny.

Again, as these supersensitive functional centres are ever subservient to the behests of any control, how great the danger from the secret menace of pathological forces, ready to impose an abiding condition at this incipient period of cell-life that will inhere throughout all subsequent proliferation to the ultimate formation within the function of this particular cell individuality!

Scrofulous taints, chalky and syphilitic teeth, are evolved in this way. Deformed and degenerate mouths, as well as every other inherited pathological condition, are the result of metamorphosed or perverted cell-action.

Cell-action or function is invariably dependent upon composition, quantity, and kind for the part it plays in the economy.

The osteoclastic cell which arises from the white blood-corpuscles does so only by a metamorphosic action, which involves chemico-organic change.

The odontoblast, which in the primate architecture of ontogeny was normal and endowed with the ids and determinants of full power, may, under the appalling influence of a fever or cold or malarial poison, mercurial or other mineral medicinal toxicants, inhibited in early formation of life, be so changed or wrought upon as to show in its work an inefficiency hardly recognizable as compared to the pleasing result of uninterrupted, harmonious functional action.

The nutrient supply and growth is maintained from the cell-plasm substance, attracted by the alternative positive and negative conditions subservient under the immutable law of involution.

THE USE OF GUTTA-PERCHA AS A ROOT-CANAL FILLING.

BY S. FREEMAN, D.D.S., NEW YORK.

IN the reading of the March edition I notice Dr. Eddy's paper on the above subject, as well as the discussion thereon. In this paper I will not explain the different methods employed, nor the treatment prior to their filling, but will state my mode of filling in a very concise manner. After thoroughly treating and drying the root-canal, take a Dunn's syringe with a platina point, and inject a drop or two of a saturated solution of hydronaphthol and chloroform in the root-canal. Then take a gutta-percha cone, place it in the canal as near the apex as possible, where it dissolves; in other words make the chloro-percha in the root, then follow this with one cone after another until the canal is entirely filled. If any "chloro-percha" passes through the apex of the root, it no doubt becomes encysted. I have never had any trouble arising therefrom, and I am positive that I have passed some through the apex, because the patients have noticed it by describing to me a slight stinging sensation, which quickly subsides, and no future trouble arises. I have employed this method for a number of years, first using iodoform and chloroform instead of hydronaphthol and chloroform.

I find this method simple, clean, antiseptic, and effective.

Reports of Society Meetings.

AMERICAN ACADEMY OF DENTAL SCIENCE.

THE regular monthly meeting of the American Academy of Dental Science was held in the Boston Medical Library Association rooms on April 5, 1893, at 7.30 P.M., President Brackett in the chair.

President Brackett.—Our first subject for discussion is, "To what extent and under what conditions is the collar-crown a cause of pericemental inflammation?"

Dr. Allen.—The collar-crown, when properly fitted, is, in my opinion, rarely, if ever, a cause of pericemental inflammation.

When inflammation is present, it is usually due to one of three causes. And these are a lack of coaptation between the collar and the root, the presence of particles of cement or fragments of tooth under the gum after the crown is set, and a rough or unfinished edge in the collar.

There is probably no operation in dentistry which, if skilfully performed, yields more satisfaction than the setting of a collar-crown, nor one which, if performed in an unskilful or slovenly manner, is more thoroughly unsatisfactory.

Dr. Fillebrown.—In my opinion, collar-crowns are not likely to produce pericemental inflammation if properly adjusted. The troubles which arise are from mal-adjustment; the crown being too large or the root not properly dressed down, or the band going up too far under the gum at some one point. I have set a great many of them, and expect to set many more. This crown, as a rule, has been entirely satisfactory and as little liable to produce inflammation as any kind of crown that has ever been used.

Dr. Gillet.—When I read the announcement of our subject on the card it seemed to me that there was not much to be said, except that, if the collar was properly fitted and well set, there would be trouble only in very exceptional cases.

In the course of conversation with a student the other day, he made a statement that helps explain why, in some instances, the collar-crown is a source of inflammation. Before coming to the dental school he had studied with a preceptor. During our conversation he asked if I approved of gold caps. I told him I certainly did approve of the cap in its proper place. He said he had no faith in a gold cap set as he had been taught to set it. On questioning him, I found that, according to his method, the roots were not trimmed at all; the cap was selected large enough to go easily into place; slits were cut in the edge, and when the cap was set an attempt was made to burnish it so as to fit at the edge. I suggested to him that the fault was with the operator rather than with the method of crowning.

Dr. Stevens.—I agree with others who have spoken that pericemental inflammation from collar-crowns is due almost altogether to ill-fitting bands. Many of those used are bands with level edges, there being no attempt at fitting them over the alveolar ridge; and they are struck on the top and forced into place. I have several times, when in the dental depots, seen models for which gold crowns were being selected by the dental clerks. The roots in the models had not been trimmed, and the object seemed to be to select crowns

large enough to go over the roots, and then get the crowns into place as best they could. I presume the majority of the gold crowns that are put on are put on in that way.

President Brackett.—If there is nothing further to be said, we will proceed to the discussion of the second topic, which is, "The relative advantages of local and general treatment for obtunding sensitive dentine. Should arsenic ever be used for this purpose?"

This is certainly a practical matter in which no one of us, so far as I have knowledge, has attained the results he would like to attain, and in which general testimony and suggestion should be very profitable.

If we could control, modify, and annihilate the sensitiveness of dentine, we should rob our operations of a large part of their terrors; but in this field there is much yet to be accomplished. I hope the testimony of the evening will help on such a worthy, practical cause. I think we might do worse than to ask each gentleman in turn what he does in practice in the treatment of sensitive dentine. Shall we hear from you, Dr. Allen?

Dr. Allen.—I have no specific for this. I once thought I had, when the steam arrangement came upon the field. I found it to be useful, but somewhat disappointing in cases where I was very anxious to have things go off successfully. The pain that it caused has been the chief objection to its use. I now mainly depend upon subduing the nervous apprehension of my patient by careful preliminary treatment. This consists in being as calm and as reassuring as possible myself in order to relieve that dread which accompanies dental operations. I have also great faith in sharp instruments. When these means fail, and it is difficult to excavate, I simply go very slowly in burring out a cavity, using a sharp instrument. If it is so painful that my patient is inclined to stop the operation, I try to be still more gentle, and I say that as soon as it hurts it will be the signal for me to stop. That, however, is hardly apropos to the subject.

For an obtundent in severe cases I have used within three or four months the chloride of ethyl, which I consider is very valuable. In many cases it has been a specific. As for general, systemic treatment, I apply none, because I do not feel that it is within my province to prescribe drugs of doubtful action to subdue a condition which is going to exist three days later. I simply use means which the operation demands at the time.

Dr. Williams.—I don't know that it is worth while to repeat what I have already written in regard to preparatory treatment

for endangered pulps and for sensitive dentine. Although I believe there are cases where no harm or after-suffering results from the excavation of a tooth in which the dentine is sensitive, yet there are cases where hard fillings are prematurely introduced which result in neuralgia or even abscesses. For such cases this preparatory treatment which I have referred to is the most satisfactory of any method of which I have knowledge. I shall not take your time to explain it here, as anybody who cares to look it up can find it in the *INTERNATIONAL DENTAL JOURNAL* some time within the last two or three years.

Dr. Preston.—I have never used many of these fancy things that are now advocated. If I come across a tooth that is very sensitive, I use chloride of zinc. It will generally reduce the sensibility, and so will phosphoric acid. But when the pulp is exposed I believe the only way is to destroy it, and I generally do it with arsenic. I used to put it in twice, but now I only put it in once, although in some cases repeated applications are necessary. Some operators used to cap the exposed pulp, but such pulps never amount to anything, no matter what they are capped with.

I brought this card to show you some of the pulps that I have taken out. Those light ones were taken out with an instrument when they were alive by introducing a piece of small barbed wire, giving it a little twist, and withdrawing it. The others were destroyed by putting in arsenic. This playing with the bare nerve does not answer. They had a system called the Huelian system a few years ago; I suppose you have all heard of it. Just above the edge of the gum you drill through and stab the pulp, which lets out the arterial blood and destroys the sensibility of the tooth; but it becomes a dead tooth. I never believed much in setting crowns on dead teeth.

A gentleman met me one morning at my door and said, "I want to ask you one thing, Did you ever extract a tooth and fill it and put it back again?" I replied, "Yes, I did that more than twenty years ago." He said that Dr. — said he was the first one that ever did it.

I was looking up two or three of my cases to get at the dates, and the first one I found recorded was a Mr. Dix, dated August 29, 1840. Another one was a Mr. Russell, and the date was October 21, 1840. I met the latter gentleman about a year and a half after the operation; he stopped me and said, "If anybody wants to know about that tooth that you put back, tell them it is a first-rate one." Another case was that of a lady by the name of Harrington.

Dr. Grant.—I have no special lines to follow in obtunding sensitive dentine except to use very sharp excavators. In the way of drugs, the one thing that I have come to rely upon more than anything else is carbolic acid crystals. When there is a very sensitive tooth, I apply the rubber dam, take a carbolic acid crystal on an instrument, and let the acid drop into the cavity. I have found more people satisfied with that than with anything else that I have ever tried. It is not always successful, but, as a general thing, patients say that it does obtund the sensibility. In this way I have excavated teeth when I hadn't the least faith that I could control the sensitiveness, having made the application more to ease the mind of the patient than anything else. I believe in sharp excavators above everything else, and the system by which I have been able to get excavators sharper than by any other, is the McLean system.

After McLean discontinued making disks I thought I would try the black rubber corundum disks that I had been using for separating. I tried sharpening an excavator with one of these, and was surprised to find the keen edge that it gave. You can get an edge that is perfectly true, and with great rapidity. On an oilstone it is about impossible to secure a true edge, but with this disk you can make it exactly as you want it.

Dr. Andrews.—I have tried almost everything which has ever been suggested. Our patients demand something. I have used with some degree of success a mixture of chloroform, menthol, and cocaine. I do not remember now the proportions, but I think Dr. Eames has spoken before the society of this same preparation. But the best obtunder is a sharp instrument, and I wish here to enter a word of praise for the mechanically perfect burrs of the S. S. White Dental Manufacturing Company. I have used the Smalls instrument with some degree of success, but there were so many cases where it did not work satisfactorily that I gave it up. Hypnotism I have never tried. The method advocated by Dr. Williams has a good deal of merit. I thoroughly believe in preparatory treatment.

Some years ago Dr. Chandler spoke of finding the bicarbonate of soda tablets, such as are put up by Wyeth, of Philadelphia, an excellent thing to use in very sensitive cases. One or two of the tablets should be given at night for a few days before an appointment. I have tried this method in several cases and believe it to be an excellent thing.

Dr. Cutter.—My plan is to get the cavity as dry as possible, and

to use sharp instruments. I use the McLean process for sharpening.

Dr. Payne.—I use a warm saturated solution of cocaine in alcohol with very good success, and in the very sensitive cavities that I cannot obtund with that I use a preparatory filling of oxychloride of zinc. This filling is allowed to remain three or four months unless the pulp would be thereby endangered.

Dr. Gillett.—I have tried almost everything that I could hear of or could find. Until lately I have relied principally on Dr. Waitt's obtundent. I don't know whether he has any special claim to it, but it is put up and is for sale under his name. Its chief ingredient I understand to be caustic potash, and the result is obtained by the process of desiccation. It is sometimes very painful. Some patients like to have me use the steady current of slightly-warmed air, which dries the cavity very thoroughly and makes it less sensitive, sometimes completely removing sensation.

Dr. Stevens.—I find nothing better than dryness and a sharp instrument. The cavity should be allowed plenty of time to dry. In case a tooth is extra sensitive it is a good plan to apply the rubber dam to obtain dryness and leave the tooth for a while, doing work upon a less sensitive one. When the sensitive tooth is returned to, there will be much less pain and perhaps none at all. There is a great deal in handling the patient. I suppose Dr. Fillebrown would call it "hypnotism." We have many patients who nerve themselves up to the operation to such an extent that they will jump if we do not hurt them at all. I try to get such patients to let go of themselves. I don't know of any better way of expressing it. I have had patients who, after learning how to relax themselves, were able to have their teeth worked on with comfort and with no fear or dread of the operation.

Dr. Clements.—I rely mainly on dryness and sharp instruments, but in addition I use a remedy which is called "Robinson's Remedy." It contains carbolate of potash and possibly some glycerin. When applied warm I rarely find any objection to it, and it certainly will obtund all sensitiveness. But I think with sharp instruments and skilful handling nearly everything that is necessary can be done without the use of an obtundent, except in cases of teeth which are hypersensitive or where there is a great deal of trepidation. Of course no gentleman here would ever think of using a very large ligature of twine and tying it tightly around the teeth, thereby causing a great deal of pain and making the tooth extremely sensitive.

Dr. Smith.—I invariably use the rubber dam, and consequently all cavities that I excavate, or a large percentage of them, are dry. And yet dryness does not fully remove sensitiveness. I have used many different obtundents; the one which I have used considerably of late is a warm solution of cocaine and alcohol. I have also been using an obtundent advertised by B. L. Knapp & Co., which was first called to my attention by Dr. Eddy. He had used it with considerable success; it seems to accomplish more than the solution of cocaine and alcohol. To-day I treated a cavity on the buccal surface of an inferior wisdom-tooth; half of the cavity going down under the margin of the gum. The clamp was applied with the rubber dam and the tooth was made perfectly dry.

I would say right here that I always test a cavity to see whether it is sensitive or not; there are many cavities not sensitive without the use of obtundents. In the case that I speak of the cavity was thoroughly dried by alcohol, then dried again by means of warm air from a chip-blower. I then took a sharp instrument and excavated carefully, with the result of producing excruciating pain. I made an application of the Knapp obtundent,—I don't know whether that is the name of it, but that is the way I have it on my book,—and I waited twelve minutes by my watch. At the end of that time I was able to excavate without pain. And here let me say that we often do not wait long enough before commencing an operation. If you have several cavities under the rubber dam at one time you can work on the one which is the least sensitive first; but if you have only one cavity you must wait. I suppose my professional brother here would say that I hypnotize the patient. I tell them that this remedy is always sure, and say to them, "Now I am going to wait twelve minutes, and at the end of that time I shall commence to excavate and you will not feel it at all." And usually they do not. Whether it is because they believe what I tell them or because of the virtue of the obtundent, I cannot say; I think it is the obtundent. In some cases this obtundent has not worked perfectly, but it always obtunds in a degree; and possibly in the less satisfactory cases, if I had made a second application and waited, the result would have been very different.

Dr. Fillebrown.—I have found dryness an excellent thing, and of the drugs I have found cocaine the most successful. But the most desirable and successful of all is the application of oxyphosphate of zinc. By allowing this to remain for a time we get an improvement in the general condition of the tooth by the deposition of lime salts, and it is better able to stand the shock of excavating.

I know you are all prepared to hear me speak of the use of hypnotic suggestion in this connection. I shall not disappoint you. It has certainly been the most powerful and generally successful and satisfactory of any means that I have ever used, and it has stayed by me longer than anything I have ever tried. You know we often take up some new thing and use it in a number of cases, and it fails so often that we soon get discouraged and try something else, and so keep changing. But for a whole year this has continued giving great satisfaction and comfort to both my patients and myself, and I think more of it now and have better results with it to-day than ever before. I will say just this to Dr. Stevens, that if instead of asking his patients (to use his own phraseology) "to let themselves down," he will try active suggestion, making it positive, and saying, "Now this does not hurt you," "Your muscles are relaxing," "Your tooth is becoming anæsthetized," "You are resting," making it obligatory on the patients to receive suggestions, a great deal more can be accomplished. I am speaking now not in reference to a patient who is hypnotized, but one that is not. I had a boy in my chair this afternoon, twelve or fifteen years old, whose teeth have always been sensitive. I said to him, "Let me hypnotize you;" but he said, "Oh, no, no!" so I commenced talking to him in the manner which I have described, and the little fellow settled right down and bore the operation,—not without some pain, but with comparative comfort. The only difference between the patient who is hypnotized and the one that is not is this: if a person is hypnotized he will listen more readily to the suggestions and you will be able to make them more effective. In the opening remarks of Dr. Eames, he says, "Sensitiveness of the teeth depends upon a condition of the nerve-centres, and these centres are what we want to control. Now, it has been established over and over again by myriads of circumstances that the nerve-centres can be affected by audible suggestion so that they will fail to respond to sensations produced by a shock to the teeth or any other part. This is a physiological condition, and we may as well accept it as a fact and use it. Those of you who have not considered this before, I ask to try the active suggestion; you are not dealing with an uncanny subject; you will find it produces a wonderful effect on your patients and will prove a most effective obtundent for sensitive dentine.

We all know that fear is our greatest enemy, and if we can remove fear from our patients we can get along very well. I had a patient to-day who came four hundred miles simply because she thought I could relieve her of the terrible dread she had of dental

operations, and make it possible for her to have some necessary work done. It seems that when she was a young woman a dentist thrust an instrument into an exposed pulp and sought to remove it by immediate operation. In describing her sensations, she said, "For several moments I thought I was dead." Since that time she has been utterly unable to sit down in a dentist's chair. Seeing that she was willing to be hypnotized, I tried it last Friday for the first time and with entire success. She has been to my office four times since then, and sat entirely quiet for a good many hours and had no trouble at all. To-day I wanted to examine a dead tooth and I did not think it needed any suggestion, but she stopped me and said, "No, the terror makes it simply impossible for me to bear it." I suggested the removal of the terror, and there was not a quiver from her afterwards.

Dr. Williams.—Dr. Fillebrown's remark that if you tell patients that you will not hurt them, you really do not, reminds me of a story I came across the other day of a boy whose mother had full faith in this sort of thing under another form. The boy had the toothache and his mother took him to a mindeurer, who went through some motions with his hands and said, "Your tooth does not ache now." The boy looked up at him and said, "You lie, it does." Now, sometimes it happens that they will not believe you when you tell them that you are not hurting them.

A good many years ago a friend of mine suggested that we go and take some lessons on this subject,—biology, as it was then called. We took a course, and I practised on several patients, and one day a gentleman asked me if I thought I could fill some teeth for his wife, a lady of very nervous temperament who could not bear to have anything done by the dentist. She came to my office and the experiment was entirely successful, as she underwent a very severe operation without the slightest pain. I remember there was a large cavity in a lower first molar in which the pulp was exposed, and I cut into the pulp during this hypnotic state and took it out and cleared out the canals and dressed the roots. That I consider about as sharp a test as could be made with any anæsthetic. So there is something in it. I found, however, that it took up much time.

Dr. Fillebrown.—I don't believe that hypnotic suggestion or anything else will obtund in every case or often sufficiently to extract a pulp.

Dr. Williams.—My case was certainly one in which it sufficed.

Dr. Fillebrown.—There are limits to all things human, and I would not have any one think for a moment that anything that I

use is with me absolutely successful in all cases, or more than seldom in very severe cases.

Dr. Stevens.—Dr. Fillebrown is certainly progressing, judging from his remarks to-night, and I think he will find as time goes on that he will not need to use the verbal suggestion; he can use mental suggestion with very good effect. Some people hold that a person cannot be hypnotized without giving consent. I have seen something of hypnotism for many years, and I know from practical experience that such is not the case.

I don't know whether any of the gentlemen present have used what is called "Thayer's Obtundent," either for sensitive dentine or for application to the gums. I have found it very nice, especially for application to the gums in applying ligatures. I applied it to open an abscess for my sister, and found afterwards that in this case the skin turned white and sloughed off. Dr. Draper used some of it, and it produced the same result. There is no complaint from the patients and no bad after-results; but the appearance is unsightly.

Dr. Williams.—I should say the moral of that was not to use anything the composition of which you do not know.

Dr. Fillebrown.—My own experience is not sufficient to settle the question whether it is possible to hypnotize without consent of patient; but the literature on the subject states that only in very exceptional subjects would it be possible to hypnotize without passive consent and utterly impossible with active resistance.

Dr. Williams.—From my observations, that would depend somewhat on how much a person had been accustomed to being hypnotized. Sunderland, the famous lecturer, used to go through the audience and fix his eyes on some one and mentally will that person to get up and go on the stage. In that way he picked out his most impressible subjects and amused the rest of the audience.

Dr. Andrews.—That matter recalls an incident which took place in my uncle's office years ago. This same Dr. Sunderland was present when a teamster came in to have several teeth extracted. He went up to the man, made a few passes, and told him to sit down in the chair, and several difficult teeth were then extracted without his knowing it. Dr. Sunderland slapped the man on the back, and, of course, he came out all right and went away feeling happy. That was done without the man's consent or knowledge that he was going to be hypnotized.

Dr. Stevens.—I have seen the same thing done.

WILLIAM H. POTTER, D.M.D.,
Editor American Academy of Dental Science.

HARVARD ODONTOLOGICAL SOCIETY.

THE regular meeting of the Harvard Odontological Society was held at Young's Hotel, Boston, April 27, 1893, President Eddy in the chair.

A paper was read by Henry P. Talbot, Ph.D. (Massachusetts Institute of Technology). Subject, "Some of the Properties of Hydrogen Peroxide Solutions."

(For Professor Talbot's paper, see page 646.)

DISCUSSION.

Dr. Taylor.—One of the dental journals states that in making a solution of peroxide of sodium, cooling the water is not required, but simply that the powder to be dissolved be poured in very slowly. I would like to ask Professor Talbot about that.

Professor Talbot.—I do not know from practical experience just how far that can be done. In one case they say, cool the solution and pour it fairly rapidly, the object being to avoid heat. In the same way you might avoid heat by pouring it in slowly. Of course, just as soon as the decomposition begins it warms up the more, and the more it decomposes.

In connection with the sodium peroxide, you will find directions on the can to seal it after removing what is required, and I would strongly advise not taking any more than you need at the time, as, if it takes no moisture or carbonic acid from the air, the peroxide will gradually undergo decomposition, and after a little it is useless.

There is this difference between the peroxide of sodium and the peroxide of hydrogen: Sodium hydrate is a caustic alkali, and those solutions of peroxide which you make from it would be more or less caustic, whereas the hydrogen solutions would be acid. You will also find directions on the can to avoid grinding it. The peroxide of sodium is a substance which will liberate oxygen very rapidly, and if there is, by chance, organic matter present, the result may be something similar to that obtained when potassium chlorate and sulphur are ground together; the peroxide might give up its oxygen so rapidly as to cause a serious explosion.

Dr. Page.—Why could not these solutions be prepared and put in ounce vials, and then used as wanted, throwing away what is not used, and taking the next time a fresh vial?

Professor Talbot.—That could be done; but it would be better to

let some one keep it for you. The fifty-volume solutions of peroxide of hydrogen are so placed on the market.

Dr. Page.—The tube that I use has a gold point about an inch and a half long, and is very small at the opening. Is there any harm in using such a point?

Professor Talbot.—If you leave your instrument in the solution for any length of time there would probably be decomposition. It is recommended that glass instruments be used.

Dr. Upham.—There are tubes made of gold and lined with platinum, very small and attenuated, for applying peroxide to the root-canals of teeth. I would like to ask Professor Talbot what he thinks of the value of such a tube,—would it be better to use that, or simply a gold tube?

Professor Talbot.—I should say the gold tube. Gold does not evolve oxygen so rapidly as platinum, and the chances of decomposition would be less; but one must remember that a very short contact with either gold or platinum would perhaps do a great deal of harm to the peroxide.

Dr. Clapp.—Would it make any difference if the remedy be neutralized?

Professor Talbot.—If it is brought just to the neutral point it would be just as efficacious for your purposes, though not quite so for an actual germicide. One would have to use care in attempting to neutralize it, for if it goes beyond the neutral point, there is a spontaneous and rapid decomposition.

Dr. Clapp.—Is there any change in the appearance at such a time?

Professor Talbot.—Yes; you see the oxygen coming off.

Dr. Clapp.—The reason I have used it so little is on account of its deteriorating so rapidly; and I also think that the acid in its composition has an injurious effect. Where I have used it in pockets around teeth, it seems to me to affect the roots, making them very sensitive.

Dr. Stoddard.—I took a tooth which was freshly extracted and left it in a fifty-volume solution for about thirty days, and it did not soften the enamel at all.

Dr. Clifford.—Will Dr. Eddy tell us his experience with peroxide of hydrogen?

President Eddy.—I have used peroxide of hydrogen for three years, buying it in pound bottles. I recommend it to patients as a mouth-wash, and it keeps the mouth in good condition. I have sometimes changed to listerine, which has much stronger acid

properties than the peroxide, but is nevertheless an excellent mouth-wash.

Dr. Clapp.—What would be the best agent for following the hydrogen peroxide to get rid of the acid, water or alcohol?

Professor Talbot.—It would make very little difference; it is probably more soluble in water. What would probably be the effect of a caustic following an acid?

Dr. Clapp.—I should imagine there would be no perceptible effect on the tissue; we use caustic potash in connection with carbolic acid for pyorrhœa.

Dr. Taylor.—If the higher volumes of caustics are used, it is recommended that they be followed by a dilute acid.

Dr. Stanton.—I would like to ask Professor Talbot if he has investigated the properties of pyrozone? One of the professors of the College of Pharmacy called my attention to it.

Professor Talbot.—No, sir; I have not.

President Eddy.—It is claimed to have a strength of fifty volumes in ether. It is very caustic, and is manufactured by McKesson & Robbins, New York, who put out a caustic solution and an antiseptic. It comes in ounce bottles.

Dr. Clifford.—Do you use it?

President Eddy.—I have used pyrozone about a year. It is very good to remove stains from the necks of the teeth where the gum has receded.

Dr. Bigelow.—I would like to ask Professor Talbot if, when we have a solution of peroxide which we think may have lost its virtue as a germicide, we apply that to putrescent matter, and oxygen is liberated, that is evidence that it still has the germicidal power?

Professor Talbot.—Not necessarily, because the germicidal power seems to fall off before the evolution of gas ceases.

Dr. Bigelow.—Then really the only way we can tell is by such a test as you have made to-night?

Professor Talbot.—That is about the only way; there have been proposed various methods for quick testing, but I know of none of them that I could recommend.

Dr. Boardman.—I have used peroxide of hydrogen freely for two or three years, and have never had trouble with it in the way of disintegration. I use it with pumice in cleansing teeth.

Dr. Bigelow.—I have always supposed that as long as gas was generated it still possessed germicidal properties.

Professor Talbot.—I do not mean to say that it is entirely useless

for your purposes, but you do not want to accept it as a prompt germicide simply because it evolves oxygen. In cavities, for instance, there is a greater chance for the action to take place than there would be on the diphtheritic membrane, because there it would be promptly diluted by the saliva. The commercial solutions might be satisfactory in many cases where it is used by you, but when you ask if it is a germicide, speaking in the sense in which that term is used in the biological laboratory, I think I should have to say, probably not.

Dr. Bigelow.—How long must it remain in contact with germs to destroy them?

Professor Talbot.—A fifty-volume solution would kill the diphtheria bacilli in twenty seconds.

Dr. Taylor.—What would be a good strength of potassium permanganate solution to use in a graduated test-tube?

Professor Talbot.—Five grammes to the litre of potassium permanganate.

Dr. Taylor.—The amount reduced by a given quantity of the peroxide tells the strength of solution?

Professor Talbot.—Yes, in the proportions about as I showed you this evening.

Dr. Bigelow.—Would the peroxide of hydrogen penetrate tooth-substance itself enough to act as a germicide?

Professor Talbot.—As it does not attack sound tissue readily, I do not think it would. That question is too purely physiological, however, for me to answer.

Dr. Bigelow.—What we try to do, and think we do in some cases, is to apply some agent which will saturate the dentine as thoroughly as the germs have.

Professor Talbot.—I should say that it would follow wherever tissue has become diseased. There would be some capillary attraction there.

Dr. Werner.—Of what volume is the solution that we generally obtain at the druggists?

Professor Talbot.—Probably between fifteen and eighteen volumes. Most of the commercial solutions are of about that strength.

HENRY L. UPHAM, D.M.D.,

Editor Harvard Odontological Society.

NEW YORK ODONTOLOGICAL SOCIETY.

A REGULAR meeting of the New York Odontological Society was held on Tuesday evening, June 20, 1893, at the New York Academy of Medicine, No. 17 West Forty-third Street, New York City, with the President, Dr. Woodward, in the chair.

In the absence of the Secretary, Dr. Ives read the minutes of the last meeting, which were approved.

The order of business was changed so as to allow the paper to come first. Dr. Mayr, of Springfield, therefore read his paper entitled,—

DOES THE QUALITY OF AMALGAM DEPEND ON ATOMIC FORMULÆ?

If there existed amalgams anywhere in nature similar to those used by the dental profession, we might learn a lesson from them. The following amalgams have been found:

Silver, thirty-four per cent.; mercury, sixty-six per cent., somewhat according to the formula AgHg_2 . Another amalgam, silver, twenty-six per cent.; mercury, seventy-three per cent.; AgHg_3 . They are crystallized, dodecahedral, and very white and brittle.

From South America the following compounds have been observed:

$\text{Hg}_{56}\text{Ag}_{44}$, color, white; soft.

$\text{Hg}_{53}\text{Ag}_{47}$, color of lead; fairly hard.

$\text{Hg}_{45}\text{Ag}_{55}$, hard; color, steel.

$\text{Hg}_{47}\text{Ag}_{53}$, very hard; dark.

$\text{Hg}_{36}\text{Ag}_{64}$.

$\text{Hg}_{13}\text{Ag}_{87}$, very white, like silver; almost the same hardness.

Two gold-mercury amalgams, very soft and brittle, have been observed: one, $\text{Au}_{39}\text{Hg}_{61}$; another, $\text{Au}_{42}\text{Hg}_{58}$; both found in California.

A gold, silver, and mercury amalgam, containing $\text{Hg}_{57}\text{Au}_{38}\text{Ag}_5$, has also been observed. The latter would be entirely worthless, because it crumbles even under the fingers.

From these mineralogical occurrences it is plain that gold does not improve the quality of an amalgam. It may improve the setting, salability, and other side issues, but not the intrinsic quality.

I fail to see why there exists such a general superstition about gold; because it is the standard of money does not prove that it is

intrinsically of greater value. If gold was not used for a standard of money it would be a great drug on the market, and would rank in intrinsic value about with copper, compared with which it would have the great drawback of a much greater specific gravity. It is with gold as with man: those with the highest newspaper reputations are not by any means intrinsically the best men; quite the contrary. As an example I may quote Virchow, the famous German pathologist, who entered politics, and has not done anything of intrinsic value since the newspapers began to notice and "boom" him. His "Cellular Pathology" he published when a most unknown young teacher; he has become a scientific nonentity since he became a candidate for congresses and legislatures, but a shining public light.

It may be said that a man while obscure constitutes an average of his own; as soon as he becomes public he becomes the average of his constituency, which in almost all cases is away below his own.

This to emphasize my point about gold in amalgams.

No natural amalgam exists which contains silver, tin, and mercury; but it may be said that all dental amalgams contain more or less tin. Now, from a theoretical stand-point, tin is considered—whether it is so or not I do not know—a quadrivalent element,—that is, a substance belonging to the carbon group, to which belong carbon, silicon, titanium, germanium, tin, zirconium, lithium, lead, and thallium,—and is not considered a metal proper. I say "not considered," although I myself fail to see why we chemists keep up a distinction of metals and non-metals, if we consider tin not a metal and osmium a metal. In a horizontal group, as chemists call it, it belongs to the series silver, cadmium, indium, tin, antimony, tellurium, and iodine. This group has still many absurdities. For instance, chromium belongs between sulphur and selenium, which is an equivalent absurdity; the manganese between chlorine and bromine; the cadmium between strontium and barium. But chemistry is full of historical reverence. At any rate, if tin combines with silver into a chemical amalgam, it can be in the ratios of SnAg_4 or Sn_2Ag_2 , the first to contain 21.4 per cent. of tin and 78.6 per cent. of silver; the second 35.3 per cent. of tin and 64.7 per cent. of silver.

I have here these two atomic alloys, and you can judge of their quality. They do not seem to be much more than mixtures, approaching nearer silver the more they contain.

To consider the effect of mercury we may suppose the mercury

distributes itself over the tin and silver according to their affinities. As we have seen from the native alloys, almost any range of mercury and silver is possible. Thirteen per cent. of mercury seems to be the lowest, and sixty-eight per cent. the highest; the highest that crystallizes, therefore the most likely to occur from an excess of mercury, is that with sixty eight per cent.

Tin forms a crystallizable compound with mercury, containing fifty-six per cent. up to seventy-eight per cent; hence it may be said that, in the average, the amalgam can take up and crystallize with seventy per cent. of mercury. In the process of mixing, squeezing, and working the amalgam, a number of stages are of importance. First, the grain of the tin-silver alloy. The coarser the grain the less mercury is taken up in the first instance; the more slowly the process of hardening, but the harder the amalgam, the less likelihood of shrinking. The finer the grain the more rapidly it hardens, takes up more mercury, and is less likely to expand than to shrink. This matter of fineness of grain seems to me of more importance than even slight variations in the composition. The difference of preparing the amalgams for a cavity by the various practitioners would more than account for the difference in the final result.

As to the various admixtures, I would say that personally I consider gold and platinum as worthless. In very small traces, and made at a high temperature, they may, similar to carbon in iron, harden the compound a little, but I should not expect any such effect with any large percentage, say above two per cent. The great trouble with amalgams in the mouth does not seem to be so much their lack of hardening,—they seem almost all to be hard enough,—but with their blackening, setting, shrinking, and working qualities. In regard to the shrinking of amalgams, it yet appears to me a disputed point whether the cavity may not shrink away from them. A tooth is supposed to be far more unyielding than it really is, and I have little doubt that teeth undergo slow changes of shape, whether dead or alive. The gentlemen here will probably know more about that than I; but from the fact that the slow changes of temperature alone would, in the course of some years, make a plug loose, even in metal, it seems to me very likely that such changes occur also in the mouth.

Considering the fact that we may have to drill through amalgams, cut and scrape them, any more hardness than is needed for the purposes of the mouth does not seem desirable. The subsequent changes and blackening are complex. I have little doubt that the

condition of the mouth is a more important element than that of the amalgam.

How have the various devices worked,—for instance, lining the cavity previously not quite up to the margin with oxyphosphate, and then finishing with amalgam, leaving no oxyphosphate exposed to the action of the mouth, and allowing the amalgam to anchor essentially in the oxyphosphate? The lining with foil, tin, zinc, or aluminum,—how have they worked?

I should especially recommend aluminum foil for such purposes, because no compound of aluminum is black. The foil is made for the white signs under glass, and is quite cheap. It keeps the mercury entirely away from the cavity, because it does not amalgamate in the least.

Now, as to the other amalgams. By a relatively simple process amalgams of mercury with almost any other metal may be obtained, even with sodium or platinum,—namely, by using the mercury as the cathode in a solution of the metal. Of these amalgams, all those decomposing water may be disposed of at once; those are with the metals of the alkaline earth and with zinc; those which are very brittle or oxidize rapidly are also of no use. This throws out those of iron and the aluminum and platinum metals. Some good amalgams may be obtained with bismuth and cadmium. The first sulphurize easily, and the second—I do not know why—have a bad reputation among dentists, probably because the first amalgams, when dentists did not have the practice, were made with cadmium. So amalgams with titanium and wolfram and molybdenum might be useful, but the metals are terribly intractable: to melt molybdenum is just as much more difficult a job, compared with platinum, as the latter is compared with silver. Nickel and cobalt amalgams oxidize rapidly, thus showing that the nickel has its good qualities only when deposited in the solid sheet. Very good amalgams may be made from the remelting and renewing of old amalgams. A certain amount of mercury remains, even at a white heat of melting. This small amount causes subsequent mercury to be taken up much more readily, and as a consequence the amalgams harden with more rapidity; hence, where rapid hardening is desired, such old amalgams renewed have even certain points of advantage. As a practical matter, I would ask a little of the price of amalgams. With silver at eighty cents an ounce, and pure tin at about two cents, the price of the metal will vary between those two figures according to the proportion of each. Have you ever tried to file a large quantity of amalgam? It may be said that

with a good file two ounces an hour is about all you care to make. I have tried, by casting the amalgam in proper shape, to work chips on the lathe, and I find those fine shavings of excellent quality, even superior to filings in some directions.

If you prepare the two atomic amalgams, you will find that, strange to say, the one with less silver is by far the whitest and hardest, amalgamates much easier, and hardens more rapidly. The one with more silver has a much darker natural surface, and, when filed and polished, a slightly yellowish tint, considerably darker than the one with more tin.

From these facts I would say that only the alloy Sn_2Ag_4 partakes of some of the elements of the chemical compound. Both alloys are fusible only at a much higher heat than would be the average of the melting-point of each constituent. The alloy Sn_2Ag_4 casts very well, while the one SnAg_4 is slightly pasty, even at a temperature of melting silver.

The chemical character of the compounds is of course not very marked, but sufficiently so to speak in favor of an alloy, Sn_2Ag_4 . SnAg_4 does not take up the mercury very readily, and does not harden nearly as quickly as Sn_2Ag_4 . The latter warms slightly.

DISCUSSION.

Dr. Mayr.—The amalgams used in dentistry consist of silver, copper, tin, gold, and mercury. Those which occur in nature are certainly suitable as standards of stability, as for long ages they have been exposed to different influences, and have stood them all. There are numbers of amalgams occurring in California, Mexico, and South America. The mercury existing in them ranges from fifty-six per cent. to thirteen per cent.; we may therefore go as high as fifty-six per cent. without destroying a definite compound. The highest is well crystallized and very soft, and the lowest is almost like silver.

There exist also some gold-and-silver amalgams in nature. If you did not know their nature you would suppose that they were very valuable; they are found, however, to be entirely worthless, except for the gold to be extracted from them. A gold-and-silver amalgam which contains fifty-seven parts gold, thirty-eight parts silver, and five parts mercury, is absolutely powdery; that is to say, you can crumble it in your fingers, showing that the gold does not give very good qualities to amalgam. We frequently hear remarks similar to this: "What is there about gold that is of any intrinsic good? The color is like that of brass, and as for its weight

it is of no use at all. For instance, build a bicycle of gold, and it would weigh a ton." But all superstition must be removed when we come to talk purely on a technical point.

The maker of amalgam would like to have a little gold emphasized in it, but I think for intrinsic value the gold is of very little use. Perhaps one-half of one per cent. or one per cent. of gold and platinum, when used in a high temperature, may improve the quality of the amalgam to a very slight degree; but they do it by their disappearance, not by their showing. The carbon which makes steel out of soft iron does not show in the steel; it has become a compound; so the gold is not there as an alloy, but as a slight chemical compound with the tin and silver.

I have made a number of experiments in regard to the tin and silver. As you know, tin chemically is a member of the carbon group, to which belong carbon, silicon, titanium, germanium, zirconium, tin, lithium, lead, and thallium. In modern chemistry tin is not called a metal, but if we do not call it such all common distinction of metal or no metal disappears. We must consider tin like oxygen. The silver forms two oxides,—suboxide and monoxide.

Tin has four values. It can combine with four atoms of different univalent elements. I can have four atoms of silver combine with one of tin, or, by double combination, four atoms of silver with two of tin. Those are the two chemical compounds between silver and tin. Now, which really exists? I made the compounds, and I find that the tin which should be SnAg_4 does not oxidize; but there exists a compound of two of tin and four of silver. That is the compound which is the analogous compound of tetrachloride of tin. When I fused tin and silver perfectly pure, I found that the compound which has the most silver is entirely worthless for dental purposes. It is much darker than the one with less tin; it amalgamates very slowly, hardens poorly, is rather soft, and has the qualities of a mixture of tin and silver. The first amalgam, which I have here, contains seventy-eight per cent. of silver and twenty-one per cent. of tin. This high grade silver amalgam is of no value at all. You could not tell whether the mixture was silver or tin. The identities of both metals have been lost; therefore it partakes of the characteristics of a chemical compound. I have both specimens here. This second compound also is very hard—much harder than silver or tin alone. It is whiter than tin, and has a different cast from silver. It is very difficult to drill. The amalgam which you make from it hardens very quickly. It was made this afternoon

before I left my home in Springfield, and it mixed very nicely. I find that dental amalgams should be of the formula of sixty-four per cent. of silver and thirty-three per cent. of tin,—that is, about two parts silver and one part tin. The other formula of three and one-half parts silver to one part tin is of no value. Here is the amalgam which I spoke of. It has not hardened yet. The color of the first, with the higher percentage of silver, you will notice, is a little brighter and more shiny, but is much darker. You could readily tell which compound contained the more silver. This amalgam is still soft, while the other one, with less silver in it, is perfectly hard and strong.

Now we come to the point of the discoloration of amalgams. That cannot be prevented in any amalgam of tin and silver. The natural amalgams are not superficially dark, showing that it is not a natural atmospheric influence that causes it. It is due, in my opinion, to some sulphurizing influence in the mouth. The natural amalgams, which are constantly exposed to moisture and oxygen, do not darken. If you will put any of those amalgams in a solution which oxidizes very easily, you will find them to retain their color; but put the least trace of sulphur in, and they immediately turn black.

By lining the cavity with aluminum-foil I think you could prevent the darkness of the amalgam from showing. Aluminum has the great advantage of not alloying with mercury, but I have never heard that it has been used in dentistry. It makes an excellent lining and a perfect protection against anything showing through.

I heard from your minutes this evening that Dr. Lord gave a short paper on amalgams combined with oxyphosphate at the last meeting. I think if the oxyphosphate is kept from the very edge of the amalgam, that it will stand as long as any one desires, and at the same time will prevent the darkness from shining through.

Dr. Hodson.—About the aluminum-foil: the foil I have seen has been very harsh, and would scarcely mould to the inside of a cavity, and if we should wish to use it, there is no certainty of not splitting it before we get through. Can it be softened?

Dr. Mayr.—It comes in quite thin form. I have received it several times as thin as tin-foil. That which is ordinarily used for window signs is fairly thick, but I have seen it imported from France so thin that it could be easily folded. It is proof against mercury. It may dissolve and may oxidize, but it forms a compound which will not let the amalgam shine through. If you were to try to anneal the aluminum-foil, it would not crumble if you put

it in a glass vessel and put in a test-tube into which hydrogen gas can be introduced. I think that you will find that it could be annealed very easily.

Dr. Hodson.—I have tried it, but it was so hard I could not get much comfort from it.

Dr. Chester.—The subject of amalgams is not one that I have made any study of, except in a general way. I have perhaps studied the use of gold more than of any other metal. I have been interested in Dr. Mayr's paper and the discussion of it. It has opened a new field of thought on the chemical side. I can hardly agree fully with the essayist as to the worthlessness of gold. I cannot agree with him as to its lack of beauty. I think it is a very beautiful metal, and am sure we all like to see it.

There are some curious things with reference to the combinations of metals with each other. We speak of amalgams and alloys, and it is somewhat a question as to just what is meant by these terms. An amalgam is a combination of a metal or metals with mercury; to have amalgam, then, mercury must be present. Other compounds of metals are known as alloys. If they possess the characteristics of a new substance, as the alloy of silver and mercury, or amalgam, as we may more properly call it, that has just been described, there is no reason why we may not consider it a chemical combination rather than a solution of the metal in the mercury, and it seems to me that this view is in the line of later chemical thought.

I wish to ask Professor Mayr if he has found any crystals in any of his experiments with the particular amalgam of which he spoke?

Dr. Mayr.—Only in the tin-and-mercury amalgam which is used on mirrors. Certain crystallization can be seen, although not clearly defined. You can occasionally see little facets under the microscope. That is a compound which varies in mercury. I have found from fifty to seventy per cent. of mercury on the back of mirrors.

Dr. Chester.—This question of crystallization was one of the first that came up when it was sought to prepare, thirty or forty years ago, a crystallized gold, which afterwards came into the market as sponge gold. In 1850, Dr. Watts, who afterwards brought out gold in the fern-leaf form, began to make preparations of sponge gold, and in 1853 he obtained the first of these. It is interesting to know that the discovery of it was the result of careful experimenting on the subject, and not at all accidental. That material was made first by dissolving purified gold,—gold made as pure as it

could be by precipitation with copperas,—and washing, and then the finely-powdered material that was left was dissolved in mercury and heated for some hours to not a high temperature (I do not recall just the figure, although I have often gone through the process) until there seemed to be a combination between the gold and the mercury which differed from a simple amalgam. Then the material was dissolved in nitric acid, which will take out a large proportion of the mercury, and a mass of crystals was left, containing about six per cent. of mercury, the rest being gold. This seems to be a definite amalgam of gold and mercury. The crystals are always the same in shape, no matter how many times you prepare it. I presume many of you have seen them under the microscope. You have then very small crystals of nearly pure gold, containing a little mercury; this, when afterwards subjected to heat and annealed, forms into a spongy mass, which can be worked as a sponge gold in filling teeth. When this was discovered, it was a great step in advance. It was brought before the profession in 1853.

It seems to me clear that such amalgams, as they are called, are definite chemical compounds, with a definite crystalline form. The native amalgams of silver all crystallize in the isometric system. The only one of gold that was ever found crystalized is also in that system. I have received crystals of gold taken from works where mercury was used in amalgamating gold which were also of the isometric system, but these artificial crystals are always similar, and belong to the hexagonal systems, and I believe them to be an amalgam of ninety-three or ninety-four per cent. of gold, with six or seven per cent. of mercury.

The combination between the gold and mercury seems to require some time and, perhaps, heat, as in the case mentioned; unless the operation is conducted in this way, and the materials heated together for a certain length of time, the residue, after driving off the mercury, is a coherent mass of gold, with none of the characteristics that are desired. The use of mercury for the production of an amalgam which shall be valuable seems to me to depend on a chemical combination. That metals may become combined chemically so as to produce results which formerly would have been considered impossible has recently been proved. I have an alloy of gold, silver, and copper, in the proportion of about sixty of gold, or a little more, a little more than thirty of silver, and about five of copper, which, though containing those proportions of the metals, crystallizes perfectly. Formerly we considered it impossible for such a thing to take place.

There is one thing that needs a great deal of investigation with reference to this material for filling teeth, and that is, how much there is of chemical combination and whether the perfect material, or as nearly perfect as possible, is not one where a chemical combination takes place after the material has been put into the teeth; and therefore takes place in such a way as to produce a much more permanent result than if it were allowed to combine chemically first, and then put in. It is like the setting of plaster of Paris, which is really a chemical operation. If it once sets, unless in the place where it is wanted, it is of no further use.

How can we mix materials so that they shall have the property of working under the instrument properly, and yet of setting quickly, so they may produce their chemical combination just while we are at work on them, and get through with their shrinkage before we leave them? I do not know that I can suggest how it may be done, but there is a grand opportunity for investigation in this line.

Dr. Mayr.—Shrinkage has been mentioned. I have always been an upholder of the opinion that changes occur in teeth, and it has been my opinion that the tooth shrinks away from the amalgam, and not always the amalgam from the tooth. We consider the tooth altogether too immovable and non-changing. The teeth undergo slow and steady changes. Take, for instance, a piece of copper, drill it carefully, set in it a plug of gold that is not tapered too fine, and let it stand for a while. That plug of gold is loose in a year, simply from changes of temperature. So I think with the tooth. The contraction and expansion of tooth-structure and amalgam are extremely different. When you drink cold water, the amalgam responds at once and the tooth very slowly. The amalgam, for instance, appears sometimes to have swelled out above the edges of the tooth, when, in my opinion, it has been crowded up from underneath by the frequent changes of the tooth-structure. I think that often explains cases which we cannot otherwise understand. From making experiments in glass tubes, I do not think very much shrinkage takes place in amalgams. The elasticity of a tooth would always be up to the requirements, so I think the shrinkage of the material cannot be decided.

The next point is, in what shape we want our alloys for working into the tooth. Do we want powder, do we want grains and shavings? I think sometimes the difference in two makes of amalgam is due to nothing but the difference in grain. If you take an amalgam with a high percentage of tin, and drill into it, you will

find that you get a powder,—you do not get chips. That powder hardens rapidly, and contains more mercury in proportion than the other amalgam with a higher percentage of silver. With the other you get little chips, which take up the mercury very slowly. Apparently it does not harden, but remains crumbly a long time.

The question of grain ought to be viewed carefully. If we want a quick-setting amalgam we must have a fine powder. A slow-setting amalgam, and one that takes up the mercury thoroughly, is a coarse grain. One good plan I found was to cast the alloy in a shape for the lathe and then turn off a small chip. That gives a mixture of fine but essentially small shavings. I find those chips and shavings take up the mercury very nicely, and more regularly than the powder. I think that point explains the difference in many kinds of amalgam. I am in doubt whether the gold in amalgams does any more than temper it a little. Suppose we had cooking-vessels of gold. Every housewife would groan at the weight of those vessels, because gold is so soft that the vessels would have to be made an eighth of an inch thick. Copper is certainly far preferable for that purpose. Suppose we had gold wire instead of the ordinary wire we use. It would break from its own weight. Water-pipes could not be made of gold. What could we use gold for, if not for money? As to the aluminum, it is one of the industrial fakes until its price falls below that of zinc. I have in eight years not been able to find a use in my laboratory for anything made of aluminum. Sometimes I could use it by fusing it with other metals, but by itself I could do nothing with it. So with gold. You cannot drill it nicely, and cannot do anything with it. As to its beauty, that is a matter of taste. I think gold looks like brass, and I see no beauty in it. The intrinsic value of gold is not great. As for filling teeth, "there is not enough gold in the United States to fill the teeth of all the old women," as some one in Kansas said recently; at the same time, gold fillings have a great advantage in many cases, in that the finish does not change. Gold in plates has great advantages over platinum, and certainly over aluminum plates. Dr. Searle, of Springfield, had aluminum plates about forty years ago. He found that after very little use the food and acids ate little holes in them. I would like to know how those plates have worked of late. They have been introduced again, and I think with better success.

Dr. Watkins.—Professor Mayr said that discolorations of amalgam fillings were due to sulphur and moisture. I would ask him if that discoloration is not due to the moisture becoming incorporated

in the amalgam before it is set or thoroughly packed in the cavity? Several years ago I made a number of experiments in filling cavities with different kinds of amalgam, for the purpose of testing and deciding upon a certain kind for my own use. To illustrate I will describe one case which I think will explain the matter thoroughly. I had a young lady with extremely soft teeth. There were large cavities on the grinding and buccal surfaces of each of the molars. I placed the rubber dam on those teeth; then filled the cavities with different kinds of amalgam,—for instance, using Lawrence's on the grinding surface of the wisdom-tooth, Dorsen's on the buccal surface of the same tooth, Arrington's on the grinding surface of the second molar, Dibble's white alloy on the next one, and so on, with the idea of watching those cases and discovering which retained the best strength and the best color. In the case to which I have reference, I put in some seven or eight kinds of amalgam. I have seen that patient about once a year ever since for the past eight years, and can see no appreciable difference in the color of all those different kinds of amalgam. The Lawrence amalgam, which is generally supposed to turn very black, is just as light as the Dorsen amalgam; not exactly the same shade; perhaps a little more of a steel-color than the Dorsen, the Dibble, Shumway's, Hood & Reynolds's, or Welch's; but the amalgams which we have always supposed to turn dark immediately were just as good a color as the others, so there was no appreciable difference. So far as the edge-strength was concerned there was no comparison. The Lawrence amalgam had the best edges of any. I do not know what the proportion of silver is in that amalgam.

Dr. Mayr.—Is that not a high silver amalgam?

Dr. Watkins.—I do not know. It is very hard when I pack it in the cavities.

Dr. Lord.—Professor Mayr, as I understand him, thinks that it is a question whether the amalgam shrinks, or whether the tooth shrinks away from the filling.

It would seem that his mind could be readily set at rest on that point, as it is not possible to suppose that there can be any shrinkage in the tooth-structure.

There is often found to be a space between the amalgam filling and the walls of the cavity, but it cannot be owing to any shrinkage of the latter, and can very easily be accounted for on other and positive grounds.

There is an appreciable shrinkage of amalgams made of an alloy of two or more metals. This is generally understood, and it

constitutes the great objection to the use of amalgam, though it may no doubt be employed as a filling where it is specially called for, with advantage over other materials.

If Professor Mayr can suggest an amalgam that will not shrink, or can make one, he will confer a very great benefit on mankind.

Dr. Mayr.—The whole reasoning proceeds from a supposition that the natural condition of the setting of the amalgam would be shrinkage. In putting an amalgam in glass you cannot discover the shrinkage. Let it stand a year, and it is loose. What has caused it? Not the shrinking of the amalgam, but the change of temperature. So with a certain degree of temperature the amalgam was compressed by the glass, and, not being totally unyielding, it went back a little more than it had been at first. That slowly loosened the amalgam in the glass. When it was first made, it could not be moved at all.

Have not many of the gentlemen put in gold fillings in rather doubtful teeth? You have made it so the gold would not move. Suppose you had made a nice job, and the person came back to you and said, "I have lost that gold filling." What would you think? The gold did not shrink; the tooth has changed enough to loosen the gold. I have seen such a case in a large gold filling made by an experienced practitioner. A lady came to me and said something odd had happened. She was drinking coffee, and bit on something hard, and there was a piece of gold in her mouth. It had come out of her tooth. Have you never observed this, especially in dead teeth? If you take a substance like a tooth, with a cavity inside, and make it shrink in its substance, the cavity does not grow smaller. The wall shrinks from both sides. That makes the cavity larger, although the tooth has shrunk.

If you make a cavity of glue, put in a filling, and let the glue dry, how does your filling behave? The gold does not shrink, but the soft substance moves away from the cavity on the one side, and from the air on the other. I think that process goes on more than we give it credit for. As soon as the tooth gets nourishment, we have changes in shape. When a dead tooth grinds against a healthy tooth, the dead tooth wears disproportionately. The healthy tooth gets nourishment from beneath, and the dead tooth does not. In order to find changes, we would have to photograph the molars of a child, and then photograph the same tooth forty or fifty years afterwards, when I think you would find that the tooth had materially changed in shape. Of course, a few years of observation would not show.

Dr. Lord.—Professor Mayr thinks that the temperature would affect the changes in an amalgam. Is the change of temperature in the mouth, under the influence of the regular temperature of the body, sufficient to cause any expansion or contraction?

Dr. Mayr.—That change could come only from the food. If you eat cold dishes or warm dishes, the amalgam will respond to them. There is constant contraction and expansion going on, which slowly loosens an amalgam in a doubtful cavity, and a gold filling in the same way. I think the case I mentioned was caused in that way. The lady masticated on that side, and probably got all the hot and cold food there.

Dr. Chester.—I think it is the experience of most of us that we do not let ice-cream and ice-water come against our big amalgam fillings when we are eating, if we can help it. Dr. Mayr is certainly correct in reference to the popular idea being a wrong one, that there is necessarily shrinkage when metals are combined. We have found that out in making casts from various kinds of metals. When they are cooled from the liquid to the solid state, which is comparable with the change that takes place when an amalgam sets, some expand and some do not. If it is true, as is generally believed, that there is a shrinkage of amalgams, there is at that point a chance for examination and investigation to produce an amalgam which will not shrink, or which will keep its shape exactly after it has once set.

I want to say a word more about gold. For certain purposes it seems to me that gold is the ideal material for filling teeth, because it is absolutely insoluble in the fluids of the mouth. It is not changed chemically, and it is a pure substance. We do not have to consider what the alloy should be. Of course, the gold that is used in filling teeth in general is not quite pure gold. Cohesive gold is as near pure as it can be made. Gold should be made pure at first, and then copper put with it to give the proper consistence. One grain in four ounces would only be about one two-thousandth part, yet that has a very decided effect, changing it from cohesive to soft foil. The fact that it is a pure material, unacted upon by any chemical substance which would probably get into the mouth, makes it an ideal substance. If it could be worked as amalgam can, I think it would be used altogether, because the difference in the cost would not be very great on any particular filling.

I have supposed that if sponge gold could be made that was pure and would never discolor, it would be of the greatest value for certain parts of dental work, and I know that such a material

can be prepared. I believe that the discoloration is not due to any impurity in the gold, but to a lack of care in the treatment of the material. It will not do to wash the gold with ordinary Croton water; it should be washed with distilled water to make it pure, even though it were to be melted down afterwards. I think its discoloration is one reason why many dentists have discarded sponge gold, simply because it was not properly prepared. Foils have been through the fire, but sponge golds have to be taken out of water, or some other liquid, and then dried, and, though they are annealed after that, there is not the same opportunity for purification. They can be purified, but it is not always done, as many of you have learned.

Dr. Northrop.—Professor Mayr's theory is one that I do not believe, and do not want to believe. It would knock the foundation out of honest dentistry. If Professor Mayr can demonstrate to us the true measurement of the cavity and the true measurement of the filling, and show us that that cavity has shrunk or enlarged from the filling, we should be obliged to believe it. Seeing might, under those circumstances, be believing; but hardly then. If a tooth has undercuts and still the cavity enlarges, it must admit moisture. The tooth would disintegrate and the filling be of no use whatever. If Dr. Mayr's theory is correct, operative dentistry is a farce. I should like to have him give us a demonstration of that theory.

Dr. Bogue.—I once took the trouble, with Dr. Lord's help, to get an instrument which would measure the movements of amalgam to about the thirty-two one-thousandths of an inch, and that measurement was magnified with the aid of a long needle; and every amalgam that has been mentioned here to-night, and a great many more, were examined. That little instrument was carefully watched; the room was kept at a uniform temperature day after day and night after night. Two amalgams did not shrink, but every other one did, and expanded, too. In the act of congelation, precisely as zinc and iron do, those amalgams expanded and then contracted.

In regard to the necessary behavior of amalgams, let any gentleman present imagine either a drop of lead melted, or a drop of mercury. Imagine that drop put upon a plate hot enough to keep it melted. Put into that drop filings of any metal for which that melted mass has an affinity. Let it be mercury, by way of argumentation. Put into it the filings of any amalgam you choose, only so the affinity be present. Your mercury will flatten. Put in some

more, and it will flatten more. By-and-by it will assume the shape of a little cheese. Continue your addition of filings of alloy to the last possible degree, and you can never make square corners; here is where Dr. J. Smith Dodge should receive our highest compliments, for he, as far as I know, was the first man to announce a spheroidal tendency on the part of amalgams.

There are two metals which do not contract: they are copper and palladium. They will make a sharp, square edge, and my instrument, which measured very finely, did not show any contraction on the part of either. On the part of the others, there was contraction, evidenced in some of them up to eight or ten days after solidification had taken place, and there was that tendency to a spherical shape in all of them. If Dr. Mayr can get up an hypothesis, I can too. We may assume that this tendency towards a spheroid is of universal existence. Perhaps he may say I cannot prove it. Well, I cannot; but I think this hypothesis is as good as any he has brought up to-night.

There are questions that come up to which, perhaps, it may not be necessary to allude. I do not like to see ideas emanating from this Society which are so manifestly incorrect.

Dr. S. G. Perry.—We all know that a drop of water takes a spherical shape. It may be true that amalgam fillings have the same tendency. We know that large fillings shrink and fail more readily than small ones, and this might be expected if this hypothesis is true. But there is another important factor which should be considered. Like the ivory of billiard-balls, the teeth are more or less elastic. Amalgams as well as cohesive gold fillings are inelastic, and the inharmony between the tooth and the filling is doubtless partly responsible for the bulging out and final failure of many of those large fillings. In saying that teeth shrink, I think Professor Mayr was unfortunate in his phrase. They crumble away from the fillings, and have the appearance of shrinking, but I cannot understand how this can be possible. The soft gold fillings of the old operators were more elastic and more in harmony with the teeth than the modern ones that are made of cohesive gold and are hard and inelastic.

Dr. Bogue.—I am sorry Dr. Perry did not speak of another thing which he knows exceedingly well; that is, the checking of the margins of large cavities when fillings are inserted.

Dr. Perry.—That is so important a factor that the time has gone by for the making of enormously big gold fillings of strictly hard cohesive gold.

Dr. Bogue.—Both Dr. Perry and myself have been experimenting with amalgams since those memorable experiences in 1873. Last week one of my regular patients was in my chair. When he was a boy of ten or eleven I put in amalgam fillings, some of them quite large, in the front lower incisors. Those amalgam fillings have been there a long time, I expecting every year to exchange them and put in gold. The time has not yet come for me to do so. What is the reason that one amalgam filling is a good one and another is not? There were fillings put in when I knew nothing about amalgams.

Dr. Jarvie.—Have those fillings oxidized?

Dr. Bogue.—Not very seriously. They are in the lower incisors, on the approximal and anterior surfaces. Parts of them are accessible to the brush, and parts are not, but are accessible to the silk which he uses.

Dr. Northrop.—Did you apply the rubber dam?

Dr. Bogue.—That I do not remember. There was an allusion by Professor Mayr to-night to the use of such materials as should utilize chemical affinity. I do not know whether it is generally known that silver and mercury have a strong affinity, and that silver and mercury in proper proportions will set with wonderful rapidity. I spent two days last summer in London, for no other reason than to investigate palladium, and I have not had such an interesting hour as I passed with Mr. Matthei. He has written a fine treatise on palladium. Mr. Matthei is to-day probably the owner of all the palladium that is known to exist in the world. It was found in a gold mine and was thrown out as refuse. He picked up some of it, worked it out, and found various qualities in it that he considered good. Mr. Rogers came along and wanted to see if he could not utilize it in dentistry. Plates were made of it. From plates it got to fillings, and Mr. Matthei got out a lot of gray precipitate, which was used for some time. To show how uncertain that matter is (I have had quite a correspondence with him since), he provided me with about half an ounce of palladium when I left there; the affinity of mercury with this lot was so great that it actually exploded whenever I used it. Then he sent me a larger quantity, perhaps an ounce and a half. With it he sent me a bit of palladium already amalgamated in a glass tube sealed at both ends. This amalgam, when it reached me in Paris, was soft. When I got to New York it was still not very hard. The affinity was not so great. He wrote me that he understood that palladium could be and had been used in the same fashion as copper,—that is,

it was mixed up in the morning, and the mercury squeezed out when it was wanted during the day. The way in which Mr. Matthei discovered the wonderful affinity was that he was rubbing it in his fingers together with mercury one day, and he squeezed out so much mercury that it dripped along the floor; finally he got out so much that it exploded and burnt his fingers. I have made a good many palladium fillings, but I carefully weigh out my mercury and my palladium and mix them quickly. The fillings set nearly as soon as I get them in. The whole subject of amalgams lies open for some one who has the time, means, and patience to investigate it. I sent a lot of amalgam scraps to Professor Mayr some time ago to melt up and get into fillings again, in which I have found some very curious qualities.

Dr. Mayr.—It was the most curious mixture I ever got hold of. It was very hard to get rid of the mercury in the first lot.

Dr. Bogue.—And yet it was the nicest amalgam to work that I ever saw; it mixed smoothly, set very quickly, had good edges, and remained white in the mouth.

Dr. Jarvie.—What has been the result in the teeth?

Dr. Bogue.—I cannot say, because it is only about three years that I have used it.

Dr. Jarvie.—If a filling remains in a tooth perfectly intact for three years it is pretty good testimony.

Dr. Bogue.—The fillings have served thus far admirably. They are made of some amalgam scraps of which I do not know the exact composition, although it has been analyzed since it was last melted, and traces of mercury were found in it. It seems as though its former admixtures have contributed to its present properties.

Dr. Perry.—Are you using palladium still?

Dr. Bogue.—Yes, when I can get any that is good. What I have now does not amalgamate readily.

Dr. Hodson.—What was the composition of the scraps you sent to Professor Mayr?

Dr. Bogue.—A lot of old amalgam scraps.

Dr. Hodson.—Was there any gold among them?

Dr. Bogue.—Yes; I generally wipe off the surface of my amalgam with gold.

Dr. Mayr.—You refer to a lot of old amalgam scraps which were fused down?

Dr. Bogue.—That amalgam had been melted down by Professor Mayr and filed down. There was Dibble's amalgam in it, Shattuck's, Fletcher's plastic, and some others. There was a great deal

of gold. In putting in my amalgams, the first pieces are fairly soft; after that just as hard as I can get it; then they are packed into place and rubbed with tape to make it assume the shape of the tooth. Scraps of that sort I sent to Professor Mayr, and the influence of that mercury and that former mixing, it seems to me, are the only things that can explain the curious results that were attained.

Dr. B. C. Nash.—Is it not a fact that the most satisfactory amalgam fillings that we see in the mouth are those that are absolutely black, whether they be of copper, whether they be regarded speculatively as Lawrence's amalgam, or those amalgam fillings in contact with gold fillings, which I have frequently observed of inky blackness? Do we not generally find that such fillings have not shrunk; that their edges are clean, and that the tooth-structure is not discolored?

Dr. Mayr.—I am extremely glad to hear in regard to this palladium amalgam. I find Dr. Bogue got them by using mercury in a strong solution of palladium. I worked it up, and then I had to free that little lot of palladium from the mercury, and work it over, and I became highly disgusted. Finally I melted it all together, and so at least Dr. Bogue did not lose anything.

The subject has been referred to, that I at one time stated a tooth would grow enamel again. That was not said in the sense in which it was taken. I was drawing from analogies, and was speaking of Dr. Heitzmann's observations, where we can see newly-formed dentine within the tooth, in response to reparative work. Would it not be possible that to a certain degree enamel can be supplied, of course, in a very moderate degree? One doctor told me he observed a cavity that was one-fourth of an inch from the edge of the tooth, now it is only one-eighth of an inch from the edge of the tooth, yet the tooth is as long as it was. Did that grow dentine from the root, or did enamel move from the dentine of the tooth? The tooth is as long as it was before.

I like an hypothesis as a guide. Life is too barren to live without them. We make hypotheses about everything, otherwise we do not get any new ideas.

About shrinkage,—a dry tooth is decidedly shrunk. I have seen that. When you dry the cavity you dry the tissue. Dr. Northrop's test is too hard. He says, let us take a cavity and measure it, and see if it changes. I could not have a patient walking around with a little measuring apparatus in his mouth, seeing where the cavity changes. The test is too difficult. Dr. Bogue

has probably made the experiment of putting the amalgam in glass. Does the average amalgam allow any bacteria to go through between the glass and the amalgam? Do any microbes go through? The difference must be the size of the smallest microbe. The size of a microbe is one twenty-five-thousandth of an inch. That the opening does not go beyond the one twenty-five-thousandth of an inch, I think, is proved. Absolute contact does not exist in anything. If, for instance, gold and silver are rolled together and begin to adhere, then we have absolute contact, but otherwise absolute contact is not known. The varnish that sticks to wood does not thoroughly adhere to the wood. There is air everywhere between them. So, actually, I do not think we get thorough adhesion. If you dry the cavity and put the amalgam in, then the natural condition of the tooth coming on will again take up its natural moisture. So to a slight measure you get from a tooth, assuming its natural condition, a swelling. There is nothing very improbable about that. We do not have feet and inches to measure by; we have ten-thousandths of an inch,—very small measurements.

The Secretary then read a letter from Dr. Hathaway in regard to the amalgam question, an abstract of which is as follows:

" . . . A few years ago I attempted to do something in the line of experiment, noting the results of various combinations, but my notes having been by accident destroyed, I cannot now speak except in a very general way.

"I was, however, impressed by the widely different results obtained from alloys made as nearly as possible under the same conditions, and varying in composition only by small percentages,—in some cases only one-half of one per cent. difference in the amount of gold or zinc. . . .

"My process is simply this: With a well-ignited coal-fire in my laboratory stove,—or, better, with a charcoal-fire,—the crucible, first rubbed over the inside with borax, is gently heated and the tin melted first, then the silver is added in small pieces, and the melting mass, which is kept at as low a temperature as possible, is stirred with a clay pipe-stem or an oak stick. As soon as the silver is melted, the gold, or copper, whichever is used, is added,—the copper in the form of wire rolled as thin as possible. As soon as the melting is complete it is quickly turned into a cold ingot mould; then all that remains is to file with a somewhat coarse file, and remove bits of steel with a magnet, and the alloy is ready for use.

"Two formulas, which I make constant use of, are given,—viz.:

Silver	55 parts.	Silver	45 parts.
Tin	40 "	Tin	45 "
Copper	5 "	Gold	10 "

"One gives a black amalgam, the other a light-gray; both have good edge-strength, shrink but little, and take a good polish. I have made many others, but these are my main reliance.

"The four metals named are the only ones I consider of value. Platinum seems to me to be nearly or quite inert, and zinc, while it gives whiteness, gives also a greasy feel which I detest, and I suspect it tends to cause weak edges and the spherical form in crystallization. Of the latter I am not definitely certain, but do not now use it in my alloys.

"The preparation of the amalgam for the cavity is, I think, best made in the following manner, suggested first, I believe, by Dr. Rollins: The powder is placed in the mortar with a small quantity of a one- or two-per-cent. solution of sulphuric acid, the requisite amount of mercury added, and the mass rubbed up before the acid is poured off; the pellet afterwards washed in clean water. I do not believe in working amalgam as dry as some advocate. I want it plastic enough to pack well, and like to have it packed before crystallization has far advanced.

"The quality of mercury used is, I think, a matter of consequence, and may explain some of the difficulties with amalgam."

CASUAL COMMUNICATIONS.

The Secretary read the following communication from Dr. Crouse, with reference to the resolution offered by Dr. Littig at the last meeting:

"CHICAGO, June 16, 1893.

"DR. GEO. A. WILSON, *Corresponding Secretary New York Odontological Society*:

"DEAR DOCTOR,—Your communication from the New York Odontological Society is before me. In reply would say, if it is desired by the different dental societies that the Dental Protective Association take up the work of petitioning Congress to have the tariff or duty reduced on dental goods imported to this country, the Association will undertake the task. We believe, however, before such work is entered into we should have a distinct understanding with those importing goods to this country, as to whether or not the benefit of such reduction as might be made by Congress would go to those prac-

tising dentistry or to the dealers. This is a feature of the work which can be looked into and arranged with the importers, I presume.

"It seems to me that it would be wise for some one to correspond with the different societies, and, if they so desire, ask them to make the same request of the Protective Association before the work is undertaken.

"Thanking the Society for its confidence, I remain,

"Very truly yours,

"J. N. CROUSE,

"Chairman."

Dr. Littig.—I would move to lay this communication on the table until the fall meeting.

Seconded. Carried.

Dr. Howe.—I received a letter from Dr. Crouse yesterday, in which he sent me some burrs and some samples of amalgam that the Dental Protective Association are about ready to issue to the members. I have tried the burrs pretty severely, and I find them, in quality of cutting-edge and temper, to be very fine indeed; equal, I think, to anything I have ever used. Members of the Dental Protective Association will soon have an opportunity, I understand, to obtain these products at the lowest possible prices.

Dr. Bogue.—I received the other day a letter from Paris, containing an account of the most audacious operation in oral surgery that I ever heard of. The history of the case is very quickly given. A young girl had a resection of the lower jaw, from which was taken about two inches. Dr. Michaels was called in by Dr. Paion, the surgeon in the case. After the operation had been performed and the wound healed up, the cicatrix was reopened, the two ends of bone separated to their proper positions as they were previous to the operation, and a ladder of gold was put in and screwed to the two pieces of the lower jaw. The soft parts were put together and closed with a suture. The first operation was performed on February 4, 1893, and this letter of June 8, five months after, shows that the wound has entirely healed up, except in one small point, and the girl is quite comfortable. There is a photograph here illustrating it. Two inches of the lower jaw were taken out, one end of the gold ladder was screwed to the small piece at the ramus, and the other end to the larger piece towards the chin, and the whole apparatus was covered up by the integuments.

Dr. Ives.—I have a case of some interest to present, the result of an implantation; interesting as an operation, because performed

by the apostle of the principle, and of late somewhat severely condemned by the prophets; performed in his own office in California, and presumably, therefore, under the most favorable circumstances. The lady, a patient of mine, came directly to me on her arrival here, and I gave the case the most careful attention. For some little time it did not look promising, but eventually seemed an assured success. I have not the exact dates to give you to-night, but I think it is a little less than two years since it was implanted. Six months ago it was perfectly firm and promised well. Two weeks ago it dropped out. It tells its own story better than I can. I can only repeat a remark I overheard Professor Heitzmann make at one of our meetings at the time Dr. Younger was presenting his method in this city,—“It may remain firm for a time, but it is mighty poor surgery.”

Dr. Perry.—I do not consider that an argument against implantation. I have implanted nearly a hundred teeth since this method was first introduced. I do not suppose I have saved half of them, but I have saved pretty nearly half, and many of them have been in six and seven years, and they are considered priceless by the patients. Because a tooth has become absorbed I do not consider it an argument against implantation, for another can be placed in, and even two or three, if necessary. I have implanted three times in the same socket, and finally got a good result. Implantation has a place in dental practice, and should not be rashly adopted or quickly condemned.

Adjournment.

JOHN I. HART, D.D.S.,
Editor New York Odontological Society.

Editorial.

EDITORIAL CORRESPONDENCE—THE WORLD'S COLUMBIAN DENTAL CONGRESS.

CHICAGO, August 19, 1893.

THIS is the last day of the long-expected and much-worked-for Congress, and now that it has closed its labors it is proper to give the impressions it has created, for more than this could not be given in a letter.

The number present, while large, has been by no means equal to general expectations, being, up to Friday, nine hundred and seventy-one Americans and one hundred and twenty foreigners.

The arrangements prepared by the Executive Committee, while judicious from an orderly point of view, have not been entirely satisfactory in other respects; indeed, have had the effect to measurably destroy interest in the proceedings.

The programme, as arranged, called for a general meeting of the Congress each day at 12 M. At this meeting one paper of supposed general interest was to be read. The discussion (?) was generally limited to one person, or cut off entirely at the option, apparently, of the presiding officer. At 2.30 P.M. the eight sections were called to order in different rooms, each section having the consideration of one subject. In the evening, lectures and lantern exhibits. The real work of the Congress was comprised between 2.30 and 5 o'clock. This, briefly, is an outline of the order of business.

The first day, Monday, the 14th, extended the time very considerably. Beginning at 10.30 A.M., the Congress was opened by prayer by Professor Taft, followed by a short address of welcome by President Bonney, of the World's Congress Auxiliary. The ceremony of introducing the officers of the World's Congress and foreign visitors then took place. In the case of the latter short responses were made.

The President then delivered his address, choosing for his subject the prominent historical periods in dentistry.

Very little can be said in commendation of this day's work. It was made entirely too long, the session ending at half-past two. It was tedious and in many respects unworthy the occasion.

The paper on Tuesday at 12 M. was, doubtless, a valuable one from a scientific stand-point, but the acoustic properties of the hall being bad, combined with the foreign accent of the reader, made it difficult to understand the thought of the writer.

The first experience with the work of the sections took place that afternoon. A brief examination of the rooms demonstrated quite conclusively that this plan of holding dental conventions could not be an entire success. This should have been foreseen. The natural feeling is while sitting in one room with twenty or thirty others, isolated from the balance of the Congress, that possibly the subject and paper under consideration may not be the most interesting of the series. This induced a restless feeling, and the constant stir of moving feet only added to the difficulty, and was not conducive to a scientific frame of mind.

Some of the sections have been throughout the week largely attended, but in others it seemed difficult to secure auditors sufficient to give life to the proceedings.

The impossibility of dividing one's personality into eight sections left the feeling at the close of the day of having accomplished very little of real scientific value; at least such was the experience of the writer. Truth requires that this was not the experience of some fortunate ones, who reported exceedingly valuable sessions in some sections. It is to be hoped that the full report may show something worthy of the Congress, and for this all who desire to secure a correct idea of the work accomplished will be obliged to wait.

It is to be presumed that the possibility of great crowds led to this division, and the Executive Committee was probably fully justified in acting as they did; but as the expected thousands have not put in an appearance during the week, other arrangements could have been made far more satisfactory to those in attendance. The large hall with its galleries would have accommodated all. There is a magnetism in numbers which the section arrangement can never give.

Had the committee borne in mind the great success of the Oral Section of the International Medical Congress at Washington, D. C., they would never have consented to this subdivision.

The arrangements for the clinics were about as bad as they well could be. The room was not large enough, and combined with a low ceiling made an atmosphere unbearable. It is always difficult to make clinics satisfactory, and these were practically rendered valueless by the conditions and environments.

The government of the meetings has been in the highest degree autocratic. The person who had paid his ten or more dollars to become a member naturally indulged the expectation that he would have the privileges usually accorded to such. Those who entertained this idea must have been rudely shocked, as nothing of the kind was permitted.

Each member was provided with a *button*, and unless this was in its place he was not allowed to enter, a guard being placed at all doors. If a member made or attempted to make a motion in the general meeting he was immediately called to order, and informed that the Executive Committee had provided for all contingencies.

In a social sense the Congress has been a decided success, and if it have no other good result, this will amply justify its having been called. For the first and perhaps the last time persons widely separated have met and interchanged social courtesies as well as

scientific opinions. In this respect it was the most remarkable gathering the writer has ever attended. There were several reunions of college graduates during the week, notably that of the Department of Dentistry of the University of Pennsylvania and also one by the Department of Dentistry of the University of Michigan.

The Women Dentists of the World held a meeting on Friday morning. It was largely attended by delegates from various States and by several from abroad. The session was an exceedingly interesting one, and as the first international gathering of women dentists, may be considered the most remarkable gathering resulting from this Congress. It marked a distinct epoch in the world's thought.

Whether the Congress has proved a scientific success it is difficult to determine at this writing, for the reasons given; but it certainly has had one good result, in drawing a large number of people to the last and, perhaps, the greatest of the world's efforts, the Exposition at Jackson Park. Its marvellous beauty and value from an educational stand-point must amply repay for the time and expense involved in getting here, even for those who may have encompassed half the earth to see it.

J. T.

DUTIES OF THE HOUR.

THE conception of human welfare is not a fixed, but an ever-growing one, imposing new and increasing duties upon us. Every advance in intelligence brings with it not only an increase in comfort and happiness, but new obligations to all who partake of it. Consider, first, the duties of labor and rest; one is quite as important as the other. A well-known editor in retiring recently from his active labors took no little pride in the fact that he had worked continuously for forty years without taking a vacation. While his work has been able and useful, we doubt if his pride in his record of continuous work is well grounded, but believe it to be the exception that proves the rule. He had done well without vacation, but what new light might have shone from his journal had he stopped writing long enough, at least once a year, to have renewed his physical and mental vigor and gained new inspirations, which would have given greater variety and breadth to his work. And thus it is with us, rest, diversion, and recreation are necessary if we would give our clients and the profession our best efforts.

Viewing it again from the stand-point of one's health, the care of the health is becoming more and more insisted upon, not only as a duty to ourselves but to those dependent upon us. We are constantly confronted with physical and mental break downs, due to too close application to work, and too little attention to personal health. Recently, in connection with the World's Columbian Exposition, several have been recorded. The victims have failed in nerve-strength, and practically laid down their lives by too close application to their vocation,—one of them a noble woman, who, from the severe strain of manifold duties and zealous devotion to a noble work,—the speech-teaching of deaf children,—sacrificed her life. While we should show the utmost fidelity to our profession, we should at the same time heed these warnings, and not destroy or overtax our physical and mental strength. The writer now calls to mind several members of the dental profession who, after laboring long hours at the chair, confine themselves far into the night, working upon some mechanical device which may or may not have a bearing upon their professional life; or endeavoring to solve the phenomena of spiritualism, etc. We hear them spoken of as growing eccentric, but insanity, physical collapse, or untimely death will be the penalty.

Consider, now, for a moment, the duty of justice to each other; this is gradually embracing a wider area. It is upon this one word, justice, that our entire ethical code is based. And we cannot properly deal with ethical or moral questions until we free ourselves from all personal piques, resentments, and preferences; can appreciate the positions of others, and are ready to put ourselves in the places of those with whom we may be associated, and choose their welfare as well as our own.

Again, we have a certain duty we should discharge towards the *growth* of our profession. How many read the best journals? With each recurring month our journals bring before us the thoughts and methods of those who are studiously and steadily advancing; and the dentist who has "no time to read" and learn, and thus add to his own usefulness and help to exalt his profession in public esteem, will surely fall behind. We must be progressive; one dare not in these times attempt to stand still, for, as another has aptly said, "A state of rest means rust, and rust means retrogression." How many are, through the journals or societies, contributing to its development according to the breadth of their intelligence? Intellectual progress is now greater than it ever has been in the history of the world. There are, too, more bright young men

and women entering the professions than ever before, and it should be remembered that every one is worth just as much to his profession and to the world as he gives it.

We, therefore, with our growing intelligence, with the new inspirations we have received from our vacations,—our time of rest, relaxation, and meditation,—should return to our posts of duty prepared not only to hold to the conventional and long-established obligations, but to welcome all messages which tend to arouse us from our lethargy, and point out our weaknesses and paths of duty.

Most of us who think at all have moments when we catch glimpses of something higher and better than we have yet embraced. Let us see to it that we do not discard these suggestions because they may at the time be unpopular. Professor Fowler, of Oxford, England, says truly, "We may not unreasonably hope that there will be a stricter sense of justice, a more complete realization of duty, more delicacy of feeling, a greater refinement of manners, more kindness, quicker and wider sympathies in the coming generations than there is among ourselves. . . . In all departments of human activity we are bound to do for our successors what our predecessors were bound to do, and mostly did, for us,—transmit the heritage we have received, with all the additions and adaptations which the new experiences and changed conditions of life have rendered necessary or desirable."

G. W. W.

Obituary.

RESOLUTIONS ON THE DEATH OF DR. HENRY FISHER.

WHEREAS, in the sudden death of Dr. Henry Fisher the St. Louis Dental Society has lost one of its oldest and best members, a faithful and trustworthy officer of many years, and one who had the highest interest of the Society and profession at heart; be it

Resolved, That our heartfelt sympathy be tendered to the bereaved family; and

Resolved, That a copy of this preamble and resolutions be sent to the family of the deceased, and also to the daily press and leading dental journals for publication.

W. H. EAMES.

WM. N. MORRISON.

J. B. NEWBY.

ST. LOUIS, MO., August 3, 1893.

Domestic Correspondence.

REPLY TO DR. PAGE.

CHICAGO, August 15, 1893.

EDWARD PAGE, D.M.D., CHARLESTOWN, MASS. :

DEAR DOCTOR,—I have read with much interest your recent paper on "Amalgam as a Filling-Material," published in the August issue of the INTERNATIONAL DENTAL JOURNAL, and while I am willing to believe you are entirely honest and sincere in your opinion that amalgam fillings prove no obstacle very often to the physician in the cure of the sick, I cannot give you credit for any sincerity in what you say is "your desire to get at the truth of this matter," and I doubt very much if you have ever removed in one single instance the amalgam fillings from the teeth of any patient that may have been sent to you with such instructions from the physician simply to satisfy yourself whether or not there was any subsequent improvement in the patient's condition.

You say you are "a student seeking for truth in every department of life, and desire to approach this subject of amalgam in an *impartial* spirit, without fear or prejudice." This being the case, would it not be well, when you have the opportunity freely given you, to at least be willing to meet a man in friendly debate, who could present the subject in a different light from that in which you see it, and to hear what he has to say on the subject? Would it not be well, furthermore, instead of making simple assertions and denials, which prove nothing, to take up and to investigate for yourself in a practical and scientific manner, and without prejudice, whether the statement which physicians make upon the point at issue is correct or not?

One who was cognizant of the recent action taken by the officers and executive committee of the Massachusetts Dental Society, in which I am informed you took an important part in refusing a hearing to my paper, would gather from your paper that you were more than desirous to hear the reasons why physicians advise the removal of amalgams in many instances before they can effect a cure, for you say, "Now, if there is any serious or valid reason why we should not use it; I would be glad to know it, not believe it, but have scientific evidence given supported by facts so abundant that

there would be no reasonable doubt about it." Allow me to say that a presentation of those reasons and facts were, as you well know, ready to be given you at the recent meeting of the Massachusetts Society had you really desired to hear them.

Again you say, "Therefore let those few persons who object to it on any ground give us and the *world* some good plain scientific reasons to prove it unfit to use in our practice. If there is any one who can show cause why amalgam should not be used as a filling-material, let us calmly listen to substantial proof and scientific demonstration."

Now, doctor, allow me to suggest that, considering the facts were all ready and waiting for a hearing, and which, partly by your own vote and influence, as is well known, were refused a hearing, such sentiments as the ones I have quoted from your paper are neither manly nor sincere.

Fair play is a thing that all honest men admire, and a manly and friendly interchange of opinion upon subjects of common interest among men who differ should always be encouraged in any society that claims to be scientific, and to any man in joining a society and bringing before it anything of interest can be attributed, in all probability, no baser motive than one of friendly interest and helpfulness towards his brother practitioners.

Before a member in good standing is again invited to read a paper before the Massachusetts Dental Society and refused a hearing because he insists upon the natural right and privilege of every man to say for himself, without assistance from others, what shall be the title of any subject upon which it is always his prerogative to write, it is to be hoped the Society will have learned a lesson in the rules which govern fair play.

Very truly yours,

CHARLES H. TAFT.

PROFESSIONAL ETHICS.

TO THE EDITOR:

SIR,—After reading, in the *Dental Cosmos* for July, Dr. Dean's "Professional Ethics," and the editorial called forth by it, one asks, How shall we get that dental code which shall be ethical in that it subserves the welfare of the community, including the dentists? One sees two things showing the present condition of formulated dental ethics: 1, a more or less generally adopted code of ethics, but with

a growing sentiment for changing or even dropping it; 2, a certain amount of legislation differing in various localities. By all means we should have our code of ethics emanating from the most representative associations as the expression of our best men. There we will write ourselves down at what we are, and the community can and will judge us by it. But the community has no voice in formulating this code which represents our correct relation to that community. And how can it be enforced? We may punish from a professional stand-point by censure or expulsion from association, but this does not protect the community. Now, when it comes to legislation, the community has its voice, and powerful enough, as the editorial says, to cause the failure of such legislation as benefited the dentist primarily, and the community can enforce its laws if it will.

Therefore, would it not be best to let our code of ethics be a simple declaration of principles only which are comparatively easily formulated to suit all localities and put out greater exertions towards getting the laws of the community so made that they can be appealed to to decide matters just as in any line of life, business or professional? In this way the community is protected and can have its voice, and as legislation may be enforced, laws can be tried positively and the resultant experience of their practical operation will decide further changes or additions, and in the end our code of ethical principles may even change in the light of that experience. The adoption of a code has not rid us of unprofessional acts. The completion or extension of legislation will not; but it will give something tangible to control or at least punish wrong conduct, thus acting for the welfare of the community, including the dentist.

Yours fraternally,

F. A. Roy.

Notes and Comments.¹

FURTHER USE OF NITRATE OF SILVER.—The following recent communication from Dr. Stockwell is self-explanatory, and we hope others will experiment and report along this line of investigation.

¹ The assistant editor solicits contributions for this department,—new methods, new remedies and formulas, or any short practical note which may prove of value to the practitioner or student. Address 1506 Arch Street, Philadelphia.

TO THE ASSISTANT EDITOR :

" Apropos of your item on nitrate of silver in May issue of the *INTERNATIONAL DENTAL JOURNAL*, allow me to say that I am experimenting, thus far successfully, with its use in the treatment of putrescent pulp-canals. We have a class of molars where, for various reasons, it is nearly or quite impossible to reach the apex of one or more canals with the desired thoroughness and certainty. In short, all we can do is to do "the best we can." These are the cases that suggested to my mind the nitrate of silver treatment.

" With the rubber dam in place, I introduce into the chamber and carry as far as possible into the canals, a strong solution—fifty per cent. and upward—of nitrate of silver, afterwards sealing in the chamber a pledget of cotton saturated with the same, and let it remain for a day or two. Then fill as successfully as possible with such material as circumstances indicate. The object, of course, is to thoroughly sterilize the desired territory, and I have a theory that the action of the drug upon the dentine and the contents of the canals and tubuli is such that we have permanent antiseptic condition.

" Will others kindly experiment and report ?

" C. T. STOCKWELL.

" SPRINGFIELD, MASS."

Current News.

NATIONAL ASSOCIATION OF DENTAL FACULTIES.

THE Tenth Annual Meeting of the National Association of Dental Faculties was held in Kindergarten Hall, Chicago, commencing Thursday, August 10, 1893.

The Association was called to order at eleven o'clock A.M., President J. D. Patterson in the chair.

Twenty-two colleges were represented at the first roll-call.

The Ad Interim Committee reported a case in which a student, who had attended a full term at one college but had not presented himself for examination at the end of the term, and consequently received no certificate, applied for admission to the advanced grade in another college. Upon the right of the second school to examine such student, without certificate, the committee had ruled that the dean of the second school could exercise his judgment. This

decision of the Ad Interim Committee was overruled by the Association.

The Ad Interim Committee also reported in relation to a request made by the dean of the Ohio College of Dental Surgery, who desired to be informed "whether a student who regularly completed a course at a recognized college, whose six months' session ended in June, may enter the class of another recognized college the following October as a regular student." The committee had held that such second entry would not be in conformity with the rules of the Association. A motion to sustain the committee's ruling was adopted by unanimous vote.

A resolution offered by Dr. Truman restricting to one delegate from each college the privilege of speaking, voting, or acting on committees was adopted.

The Executive Committee reported a recommendation that applications for membership must be indorsed by two or more members of the Association. The recommendation was adopted. [Takes effect in 1894.]

The application of the Western Dental College of Kansas City, for membership, was again laid over for a year.

At the request of Dr. Carpenter, for a ruling upon the by-law in regard to dissections, the president ruled that the language was mandatory.

Under the call of colleges for reports, Dr. Gorgas, of the University of Maryland, Dental Department, stated that his school had under consideration the adoption of separate lectures for the three classes.

Dr. Morgan reported that Vanderbilt University, Dental Department, had abandoned the preliminary course in September, and instead would give the students a practical course at the end of the session, commencing about the middle of January, the regular term beginning the first of October.

Dr. Sudduth reported that the College of Dentistry, Department of Medicine, University of Minnesota, had adopted as a preliminary course a quiz for conditioned students. They had also changed the degree from "D.D.S." to "D.M.D."

Dr. Goddard, of the University of California, Dental Department, reported that his college had increased the requirements for entrance by adding Latin to the list of studies to be passed in examination. First-course students take also the elements of pharmacy. Each student performs a graded series of experiments in metallurgy, and for the seniors a practical course in orthodontia

has been in operation for several years. The sessions commencing this fall will begin the first Monday in September, and continue nine months.

The Executive Committee reported applications for membership from the following schools, which under the rules lie over to next year: University of Buffalo, Dental Department; Western Reserve University, Dental Department, of Cleveland.

The resolution offered last year by Dr. Winder, with reference to the admission of graduates in pharmacy to advanced standing, was taken up for action, and on a vote was lost.

The resolution on the same subject offered by Dr. Peirce at the last session was then taken up, amended, and adopted as follows:

Resolved, That colleges of this Association may admit to the junior class graduates of recognized schools of pharmacy, subject to the examinations of the freshman year.

The amendment to Article VII. of the constitution offered last year was taken up and, on motion, laid on the table.

The following resolution, laid over from last year, was adopted:

Resolved, That any college of this Association failing to have a representative present for two consecutive years, without satisfactory explanation, shall be dropped from the roll of membership of the Association.

Dr. Sudduth moved that Latin and Physics be added to the list of subjects now required for entrance into the colleges belonging to the National Association of Dental Faculties, with the understanding that a student may take one condition, which must be made up before he will be allowed to take the junior examination. Under the rules this lies over.

The Executive Committee reported favorably upon the application of the Detroit College of Medicine, Dental Department, of Detroit, Michigan, and the Homœopathic Hospital College, Dental Department, of Cleveland, Ohio, recommending them for membership. The report was adopted as to the Detroit College, which was thereupon elected to membership. The recommendation with reference to the Homœopathic Hospital College was rejected, and the matter referred back to the committee for further investigation. The committee reported later adversely; the report was adopted and the application was rejected.

The Executive Committee also reported that Howard University, Dental Department, of Washington, D. C., had requested that its application lie over another year.

The Executive Committee reported adversely upon the United States Dental College, and the report was adopted unanimously.

Dr. Morgan offered the following, which lies over one year:

Resolved, That a certificate of attendance from a medical school, to be accepted as the equivalent of one course in dentistry, must show that the student attended at least seventy-five per cent. of a five months' term, and also passed a satisfactory examination in his freshman year.

Dr. Truman, chairman of the special committee appointed to investigate statements made by Dr. Sudduth in a paper before the Academy of Dental Science at Boston, reflecting upon the conduct of certain dental colleges, made a minority report, recommending that Dr. Sudduth be censured for the language used. By a vote of ten to twelve the recommendation was rejected, most of those voting in the negative stating their belief in the want of jurisdiction by the Association.

A communication from the Royal College of Dental Surgeons, Ontario, resigning its membership in the Association, was presented by the Executive Committee, and on motion it was ordered that the resignation lie on the table until the next annual meeting, and that the college be requested to send a delegate to the meeting in 1894.

Dr. Hunt moved the repeal of the rule admitting undergraduates in medicine to the junior grade. Laid over.

Dr. Hunt moved that the rule upon the standing of graduates in medicine be amended to read as follows:

A diploma from a reputable medical college entitles the holder to enter the second or junior grade in colleges of this Association, and he may be excused from attendance upon the lectures and examinations upon general anatomy, chemistry, physiology, materia medica, and therapeutics.

Laid over under the rule.

The Executive Committee reported the following resolution, which was adopted:

Resolved, That a committee be appointed to formulate a series of subjects and questions for preliminary examinations, and a minimum standard to be reached before admitting students to colleges.

The election of officers resulted as follows: President, H. A. Smith, Cincinnati; Vice-President, C. L. Goddard, San Francisco; Secretary, J. E. Cravens, Indianapolis; Treasurer, Henry W. Morgan, Nashville, Tennessee.

Executive Committee.—A. O. Hunt, Iowa City, Iowa; J. Taft, Cincinnati; Frank Abbott, New York.

Ad Interim Committee.—James Truman, Philadelphia; Thomas Fillebrown, Boston; W. H. Eames, St. Louis.

The newly-elected officers were installed, the retiring and incoming presidents each returning thanks briefly and gracefully.

The following committees were appointed:

Committee on Schools.—J. A. Follett (Chairman), F. J. S. Gorgas, Louis Ottofy, C. N. Peirce, and Truman W. Brophy.

Committee on Text-Books.—S. H. Guilford (Chairman), J. D. Patterson, Thomas Fillebrown, A. O. Hunt, J. Hall Lewis.

Special Committee to prepare Subjects and Questions for Preliminary Examinations.—Francis Peabody, W. Xavier Sudduth, Henry W. Morgan.

Adjourned to meet at the call of the Executive Committee.

The following colleges of the Association were represented by the delegates named during the sessions:

Dental College of the University of Michigan.—J. Taft.

University of California, Dental Department.—C. L. Goddard.

University of Pennsylvania, Dental Department.—James Truman.

Chicago College of Dental Surgery.—Truman W. Brophy.

Indiana Dental College.—J. E. Cravens.

Columbian University, Dental Department.—J. Hall Lewis.

Pennsylvania College of Dental Surgery.—C. N. Peirce.

State University of Iowa, Dental Department.—A. O. Hunt.

New York College of Dentistry.—Frank Abbott.

Dental Department of National University.—J. Roland Walton.

Northwestern University Dental School.—C. P. Pruyn.

American College of Dental Surgery.—Louis Ottofy.

Baltimore College of Dental Surgery.—M. Whilldin Foster.

Harvard University, Dental Department.—Thomas Fillebrown.

Missouri Dental School.—W. H. Eames.

College of Dentistry, Department of Medicine, University of Minnesota.—W. Xavier Sudduth.

Louisville College of Dentistry.—F. Peabody.

University of Maryland, Dental Department.—F. J. S. Gorgas.

School of Dentistry, McHarry Medical Department of Central Tennessee College.—G. W. Hubbard.

Vanderbilt University, Dental Department.—Henry W. Morgan.

Kansas City Dental College.—J. D. Patterson.

Boston Dental College.—J. A. Follett.

Northwestern College of Dental Surgery.—B. J. Roberts.

Ohio College of Dental Surgery.—H. A. Smith.

Philadelphia Dental College.—S. H. Guilford.

Dental Department of Southern Medical College.—L. D. Carpenter.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

THE Twelfth Annual Meeting of the National Association of Dental Examiners was held at the Columbia Dental Club, Chicago, Friday, August 11, commencing at 10 A.M., the president, Dr. W. E. Magill, in the chair. Owing to the death of Dr. Fred A. Levy, the late secretary, Dr. Edgar Palmer was appointed temporary secretary.

The roll-call of States resulted as follows:

State.	Represented by
California	J. D. Hodgen.
Indiana	{ M. H. Chappell.
	{ S. T. Kirk.
Kentucky	C. S. Edwards.
Louisiana	Joseph Bowen.
Maine	D. W. Fellows.
New Jersey	{ G. Carleton Brown.
	{ F. C. Barlow.
Ohio	{ L. E. Custer.
	{ James Silcott.
	{ C. V. Kratzer.
Pennsylvania	{ Louis Jack.
	{ W. E. Magill.
Tennessee	{ H. E. Beach.
	{ J. Y. Crawford.
Wisconsin	Edgar Palmer.
Massachusetts	J. Searle Hurlbut.
District of Columbia	{ Williams Donnally.
	{ H. B. Noble.
Illinois	C. Stoddard Smith.
Kansas	A. W. Callaham.
Mississippi	W. E. Walker.

The following resolution, laid over at the last annual meeting, was taken up:

“Resolved, That it is the sense of the National Association of Dental Examiners, that when a member of the dental profession presents a certificate of registration from a State Board of Dental Examiners, duly created by law, that the same should entitle the holder of such certificate to registration without an

additional examination in any State of the Union having a law to regulate the practice of dentistry."

Dr. C. Stoddard Smith offered the following amendment:

"*Provided* such certificate was obtained on examination."

Discussed by Drs. Donnally, Jack, Noble, Kirk, Smith, Crawford, and others.

The amendment was accepted, and the resolution was then laid over till the next annual meeting.

Reports were received from the following State Boards: Wisconsin, Kentucky, California (verbal), Illinois (verbal), District of Columbia, Maine, Pennsylvania, Massachusetts, and Kansas (verbal).

Dr. Magill reported that there had been additional legislation passed in the State of Pennsylvania, dated June, 1893. (See *Dental Cosmos*, current volume, p. 571.)

Dr. C. G. Edwards said that on account of the difficulty experienced in finding persons to move against illegal practitioners under the old law, the State Board of Kentucky had had another law passed at the recent session of the Legislature, requiring the registration of all practitioners of dentistry, which it was hoped would be enforced. Dr. Edwards also reported that at the recent meeting of the Kentucky State Association a resolution had been passed strongly condemning the use of secret remedies in dentistry.

Dr. J. Y. Crawford said that he had given much attention during the last nine years to dental legislation, and had submitted propositions to some very good legal authorities. His thought was that laws should be introduced that would be retrospective in their action.

He thought that if the profession in the different States could agree upon what was desirable and draw up a law that would be simple and yet embrace all that was needed to protect the communities, all of the States would eventually adopt it, and dental legislation would thus be uniform throughout the whole country. He insisted that the law should be so simple that there could be no chance of misconstruction, and that it should be drawn in conformity with the views of able jurists and intelligent people in other professions. It is not possible to draw up a law that will suit every dentist, but every reputable dentist should be taught that it is his duty to see that the law is enforced, and to assist in detecting those who practise illegally.

Dr. J. D. Hodgen presented and read the amendment to the

California law passed at the last session of the Legislature, which provides as a punishment for violation of the law a fine, upon conviction, of not less than fifty nor more than two hundred dollars, or imprisonment for six months for each offence; half of the fines recovered to go to the common school fund of the county in which conviction occurs, and the other half to the informer.

A report from the Committee on Dental Colleges, recommending that it be established as a preliminary condition to the reception of applications to be placed upon the list of recognized colleges for admission to the National Association of Dental Faculties, was adopted.

On motion, it was ordered that applications received at this meeting lie over until next year.

The Committee on Colleges presented its final report, which stated that of the recognized schools for the session of 1892-93 the number of students was: Freshmen, 1429; juniors, 927; seniors, 433; graduates, 320; post-graduates, 44; one school not having reported. Of the unrecognized schools the number of students was: Freshmen, 111; juniors, 54; seniors 22; graduates, 20.

The committee also reported, through its chairman, Dr. Jack, the following list of colleges recognized by the National Association of Dental Examiners as reputable, as reported by the Committee on Colleges for 1893 and 1894:

1. Baltimore College of Dental Surgery, Baltimore, Md.
2. Boston Dental College, Boston, Mass.
3. Chicago College of Dental Surgery, Chicago, Ill.
4. College of Dentistry, Department of Medicine, University of Minnesota, Minneapolis, Minn.
5. Dental Department, Columbian University, Washington, D. C.
6. Dental Department, National University, Washington, D. C.
7. Northwestern University Dental School, formerly Dental Department of Northwestern University (University Dental College), Chicago, Ill.
8. Dental Department of Southern Medical College, Atlanta, Ga.
9. Dental Department of University of Tennessee, Nashville, Tenn.
10. Harvard University, Dental Department, Cambridge, Mass.
11. Indiana Dental College, Indianapolis, Ind.
12. Kansas City Dental College, Kansas City, Mo.
13. Louisville College of Dentistry, Louisville, Ky.
14. Missouri Dental College, St. Louis, Mo.
15. New York College of Dentistry, New York City.

16. Northwestern College of Dental Surgery, Chicago, Ill.
17. Ohio College of Dental Surgery, Cincinnati, Ohio.
18. Pennsylvania College of Dental Surgery, Philadelphia Pa.
19. Philadelphia Dental College, Philadelphia, Pa.
20. School of Dentistry of Meharry Medical Department of Central Tennessee College, Nashville, Tenn.
21. University of California, Dental Department, San Francisco, Cal.
22. University of Iowa, Dental Department, Iowa City, Ia.
23. University of Maryland, Dental Department, Baltimore, Md.
24. University of Michigan, Dental Department, Ann Arbor, Mich.
25. University of Pennsylvania, Dental Department, Philadelphia, Pa.
26. Vanderbilt University, Dental Department, Nashville, Tenn.
27. Western Dental College, Kansas City, Mo.
28. Minnesota Hospital College, Dental Department, Minneapolis, Minn. (Merged into No. 4.)
29. St. Paul Medical College, Dental Department, St. Paul, Minn. (Merged into No. 4.)
30. American College of Dental Surgery, Chicago, Ill.

On motion, the report of the committee was adopted, and the thanks of the Association returned to the committee for their services.

The election of officers for the ensuing year was then proceeded with, resulting as follows: President, C. Searle Hurlbut; Vice-President, M. H. Chappell; Secretary and Treasurer, J. D. Hodgen, 917 Sutter Street, San Francisco, Cal.

Adjourned to the time and place of the next meeting of the American Dental Association.

AMERICAN DENTAL ASSOCIATION.

THE meeting of this Association assembled at 10 A.M., at Kindergarten Hall, Chicago.

The President, Dr. Patterson, called the meeting to order; a large attendance being present, many of whom were from foreign countries.

In view of the approaching Congress, it was not deemed expedient to extend the sessions or carry out the usual programme.

The Executive Committee reported the following resolutions, which were adopted without much discussion.

WHEREAS, The date for holding the Congress was changed since our meeting last year, when the day was, by unanimous vote, selected with the understanding that it was to be the one preceding the opening of the Congress. Therefore,

Resolved, That the unanimous action of the Executive Committee in calling the meeting in advance of the day selected be hereby approved and declared legal and binding.

WHEREAS, It has been generally understood by the members that the meeting of the Association this year should be as nearly as possible a formal one, so that more interest and work should be concentrated in the Congress, but, in order to comply with the requirements of the constitution, must be held. Therefore,

Resolved, That the dues for the coming year be remitted, and the Treasurer be instructed to give receipts in such form that the two years shall for that purpose be considered as one year.

Resolved, That the meeting this year be adjourned without any election of officers; the effect of such non-election will be, under the constitution, to make all officers hold over.

Resolved, That all records and transactions of this year be considered and published as merged in the proceedings of 1894, so that in spirit and name officers elected for one year shall not be considered to have held office for two years.

Resolved, That the Treasurer be instructed to pay all properly authenticated bills.

Resolved, That Old Point Comfort be selected as the place of meeting in 1894.

There being objections made to selecting the place of meeting for the next year without further nominations, it was decided to open this for further suggestions. This resulted in strong pleas for Lookout Mountain, San Francisco, Niagara Falls, and Saratoga, in addition to that named by the Committee. A ballot being taken, it resulted in the selection of Old Point Comfort as the place of meeting for the Association in 1894.

All reports of committees were reserved for the meeting next year.

Adjourned.

J. T.

ANNUAL MEETING OF THE CALIFORNIA STATE DENTAL ASSOCIATION.

THE Twenty-fourth Annual Meeting of the California State Dental Association was held at the College of Dentistry, San Francisco, on June 13 to 16.

The following officers were elected for the ensuing year :

President, L. A. Teague, 10 Geary Street, San Francisco ; First Vice-President, I. W. Hays, Jr., Grass Valley ; Second Vice-President, C. L. Goddard, San Francisco ; Third Vice-President, W. F. Lewis, Oakland ; Recording Secretary, W. J. King, San Francisco ; Corresponding Secretary, C. E. Post, 14 Grant Avenue, San Francisco ; Treasurer, T. N. Iglehart, San Francisco.

CHARLES E. POST, D.D.S.,
Corresponding Secretary.

MEETING OF THE BOARD OF EXAMINERS OF THE TERRITORY OF ARIZONA.

THE next regular meeting of the Board of Dental Examiners of the Territory of Arizona will be held in Tucson, commencing Monday, September 11, 1893, and continue three days. The examinations will be both written and clinical. Percentage will be decided on by the board on the day of examination, but not less than seventy-five per cent. will be required on each examination.

F. A. ODERMATT,
Secretary.

AN ACT TO REGULATE THE PRACTICE OF DENTISTRY IN ARIZONA.

Be it enacted by the Legislative Assembly of the Territory of Arizona :

SECTION 1. That it shall be unlawful for any person, who is not at the time of the passage of this Act, engaged in the practice of dentistry in this Territory, to commence such practice unless such person shall have received a license from the Board of Examiners, as hereinafter provided for.

SEC. 2. The Governor of the Territory shall appoint, after the passage of this Act, five (5) skilled dentists of good repute, residing and doing business in the Territory, who shall constitute a Board of Registration in dentistry.

But no person shall be eligible to serve on said Board unless they have been regularly graduated from some reputable dental college, duly authorized to grant degrees in dentistry, or who shall have been actively engaged in the practice of dentistry for a period of ten (10) years previous to appointment.

SEC. 3. The length of term for which the members of said Board shall hold office shall be three (3) years, except that two of

the members of the Board first to be appointed under this Act shall hold office for the term of one (1) year, two for the term of two (2) years, and one for the term of three (3) years respectively, and until their successors shall be duly appointed and qualified.

In case of a vacancy occurring in said Board, such vacancy shall be filled by the Governor in conformity with Section 2.

SEC. 4. Said Board shall choose one of its members President and one Secretary and Treasurer, and it shall meet at least once a year, and oftener if it shall be deemed necessary.

Four of said Board shall constitute a quorum.

The proceedings of said Board shall at all reasonable times be open to public inspection.

SEC. 5. It shall be the duty of each person now engaged in the practice of dentistry in this Territory, to within ninety (90) days after the passage of this Act, to send an affidavit to the Secretary of said Board, setting forth his or her name, place of business, post-office address, the length of time they have been engaged in the practice of dentistry in this Territory; if a graduate of a dental college, state the name of college; and shall pay to the Treasurer of said Board the sum of Five dollars (\$5), for which they shall receive from said Board a practitioner's certificate.

On failure to comply with the provisions of this section they shall be required to appear before the Board and be examined by said Board.

SEC. 6. It shall be the duty of all persons not holding diplomas, who wish to engage in the practice of dentistry in this Territory, after the passage of this Act, to appear before said Board at a regular meeting and pay into the Treasurer of said Board the fee of Twenty-five dollars (\$25), not returnable, and stand an examination by said Board in operative and prosthetic dentistry, and all the branches taught in a reputable dental college, and if such applicants pass an examination satisfactory to said Board, said Board shall issue to said applicant a license which will entitle him or her to practise dentistry in this Territory.

SEC. 7. It shall be the duty of all persons holding diplomas, who wish to engage in the practice of dentistry, after the passage of this Act, to present or send to the Secretary at the regular meeting of said Board an affidavit and diploma with fee (\$5), not returnable, and after said Board being satisfied that said diploma belongs to said applicant and that it was issued in good faith by a reputable dental college, said Board shall issue to said applicant a certificate of registration for said diploma.

SEC. 8. All persons receiving a certificate to practise under this Act shall register his or her certificate with the County Recorder of the county in which he or she resides, and shall pay to the County Recorder for such registration, the sum of Two dollars (\$2).

Any failure on the part of any person holding such certificate to comply with the first part of this section within thirty days (30) after receiving certificate, shall forfeit said certificate, and any certificate once forfeited shall not be returned by said Board until applicant shall have paid to said Board the fine of Twenty-five dollars (\$25).

It shall be the duty of each County Recorder, to forward to the Secretary of said Board the names of all persons having registered their certificates with them.

SEC. 9. It shall be the duty of said Board to cause to be kept a record of all its proceedings, and the names and addresses of all persons qualifying under this Act.

An annual report of the same shall be rendered to the Governor.

All moneys received by the Secretary under this Act, shall be used for the legitimate expenses of said Board, but in no case shall any money of the Territory be used for that purpose.

SEC. 10. Any person or persons violating any provisions of this Act shall be deemed guilty of a misdemeanor, and upon conviction shall be fined not less than one hundred dollars (\$100) nor more than two hundred dollars (\$200), or confined six months in the county jail, or both, for each and every offense.

All fines recovered under this Act shall be paid into the common school fund of the county in which such conviction takes place.

SEC. 11. It shall be the duty of the Prosecuting Attorney of each County to prosecute such cases when brought to his knowledge.

SEC. 12. That nothing in this Act shall be construed so as to interfere with the rights and privileges of resident physicians and surgeons in the discharge of their professional duties.

SEC. 13. This Act shall take effect immediately after its passage.

Approved April 3, 1893.

CONNECTICUT VALLEY DENTAL SOCIETY.

At the Annual Meeting of the Connecticut Valley Dental Society held at Hartford, May 17, 1893, the following officers were elected for the ensuing year: President, Dr. W. H. Rider, Danbury, Conn.; Vice Presidents, Dr. W. O. Barrett, Ware, Mass.; Dr. C. C.

Barker, Meriden, Conn.; Secretary, Dr. George A. Maxfield, Holyoke, Mass.; Assistant Secretary, Dr. A. J. Cutting, Southington, Conn.; Treasurer, Dr. F. R. Rice, North Adams, Mass.

GEORGE A. MAXFIELD, D.D.S.,
Secretary.

RESOLUTIONS OF CONNECTICUT VALLEY DENTAL SOCIETY AND CONNECTICUT STATE DENTAL ASSOCIATION.

At the Union Meeting of the Connecticut Valley Dental Society and the Connecticut State Dental Association, held at Hartford, Conn., May 16, 17, and 18, 1893, the following resolutions were unanimously adopted:

WHEREAS, Several compounds or processes more or less familiar to the dental profession have and are being promiscuously advertised as secret, and those which have been proved either useless or injurious advertised as wonderful; and

WHEREAS, Such false and vicious advertising is a detriment to our patients and ourselves; and

WHEREAS, All known local applications, powerful enough to completely destroy the sensibility, are capable of doing serious injury to tooth structure and possibly to health; therefore

Resolved, That we hereby condemn the practice of the use of such nostrums by the profession, and recommend that any and all legitimate means be used by the members of our societies to educate the public and guard them against possible harm which may result from the use of these nostrums.

GEORGE A. MAXFIELD, D.D.S.,
Secretary Connecticut Valley Dental Society.
GEORGE L. PARMELE, M.D., D.M.D.,
Secretary Connecticut State Dental Association.

AN ACT TO REGULATE DENTISTRY IN WYOMING.

THE bill to regulate dentistry became a law February 18, 1893. It provides that it is "unlawful for any persons to practise dentistry" in that State "without having first received a diploma from a reputable dental college or university, recognized as such by the National Association of Dental Examiners." This is not to apply to those already in practice, nor to prevent "physicians and surgeons from extracting teeth."

The other sections of the act are arranged to enforce its provisions.

THE International Dental Journal.

VOL. XIV.

OCTOBER, 1893.

No. 10.

Original Communications.¹

TEETH OF THE LOWER JAW AT BIRTH.²

BY DR. FRANK ABBOTT, NEW YORK.

HEITZMANN and Bödecker (*Independent Prac.*, vols. vii.-ix.) in their "Contributions to the History of the Development of Teeth" brought their researches up to the ninth month of foetal life. I have followed these studies up to the time of birth, in order to ascertain at this period the progress of development of the temporary as well as the permanent teeth during the last months of foetal life. Two lower jaws of apparently well-developed new-born babes were excised soon after death, stripped of their soft tissue, and placed for preservation in alcohol. Afterwards they were placed in a one-half-of-one-per-cent. solution of chromic acid for the purpose of decalcifying the hard tissues, and at the same time to preserve the soft structures. I call attention especially to this method, since it has proved in our hands to be the safest for the preservation of the teeth.

Previous descriptions of developing teeth have been questioned in Germany, on the ground that the preservation of the tissues was

¹ The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

² Abstract from a paper read before the World's Columbian Dental Congress, Chicago, 1893.

not thoroughly done. After repeated renewals of the chromic-acid solution, the jaws were supposed to have become soft enough to be cut with a razor; but it was found that the central portions after they had been cut up into blocks were still hard, and had to be again immersed in the chromic-acid solution for the completion of the decalcification. The blocks had been obtained from the right half of each of the jaws, and were cut radiatingly, in order to obtain antero-posterior, vertical sections. The blocks were embedded in celloidin, sliced into thin sections, and each section numbered with the utmost care, in order to keep the succession of the teeth unbroken. Thus the section could be examined and those selected for mounting which contained teeth, or features belonging to the process of the development of teeth. The sum total of the sections thus obtained was one hundred and twenty-five. Out of these, again, only those were selected for study and drawing which showed the teeth in the greatest perfection, the most central section being selected for drawing.

Before entering into the description of the teeth I wish to say that one of the jaw-bones, under the microscope, was found to be slightly rachitic, as proved by some scanty islands of hyaline cartilage found in the bone-tissue; though the baby was to all appearances normal. Previous observations have established the fact that congenital rachitis is first shown under the microscope by a retardation of development of bone-tissue in the lower jaw, before any abnormal systems appear to the naked eye, either on the skull or shaft-bones. It is evident that in this case the rachitic process has caused a slight delay in the formation of dentine and enamel. This assertion is clearly established by a comparison with the sections from the second jaw, in which there was not the slightest symptom of rachitis. The best specimens, however, and most of the drawings, were obtained from the first jaw. The slight deficiency in the deposition of lime-salts enabled me to obtain nearly perfect sections, whereas nearly all of the sections of the second jaw were very imperfect.

Another difficulty arose; as before stated, all the sections were made in an antero-posterior vertical direction. Some of the temporary and most of the permanent front teeth are, as is well known, irregular, or devious within the jaw, so much so that the sections do not always fully comply with the expression; consequently some of the drawings may not correspond to the greatest height or designed diameter of the tooth illustrated.

The first tooth met with was, of course, the *central incisor*. The

papilla of this tooth exhibited a bluntly ovoid shape, with a somewhat broader top, and slightly tapering to the lower end. As a matter of course, the whole papilla, at this stage, is destined for the production of the crown of the tooth only, and there is no trace yet present of the future root.

The papilla is composed of a myxo-fibrous connective tissue throughout its main bulk, and is scantily supplied with capillary blood-vessels. The periphery of the papilla shows a row of odontoblasts, only at the labial aspect, and not entirely here, even, since the lowest third of the papilla lacks in this respect. Here, and on half of the summit, as well as along the whole lingual aspect, the surface of the papilla exhibits a myxomatous medullary tissue, without an admixture of delicate bundles of fibrous connective tissue, with which the rest of the papilla is abundantly supplied. The summit of the papilla is coated with a dentine-cap and an enamel-cap, the former being in its diameter slightly in excess of that of the latter. The dentine-cap is further advanced in development on the labial than on the lingual aspect; it exhibits a non-calcified portion nearest the papilla, which has assumed a deep stain from carmine; whereas the calcified portion remained unstained.

The border-line between the two is marked by the well-known globular deposit of lime-salts. The enamel-cap, of a greenish-brown color (due to the chromic acid), stops short of the dentine-cap, and is, at its peripheral portion, made up of regularly-developed prisms. The inner epithelium, from which arise the ameloblasts, produces a perfect row all around the papilla with the exception of the apex. The place of recurvation to the outer epithelium, which latter is considerably broken at this stage of development, is noticeably deeper on the labial than on the lingual aspect. The space between the inner epithelium and the already-formed tooth is produced by a detachment of the former from the latter, and plainly shows a layer of protoplasmic bodies into which the ameloblasts have retrogressed before becoming infiltrated with lime-salts. Since this feature is pronounced in all the teeth of the jaws under consideration, the specimens are of great value in assisting at least in settling the still mooted question as to the mode of development of enamel. I propose to dwell more fully upon this topic after the description of the cuspid.

The central permanent incisor is a formation with a considerably broader papilla, but less-developed enamel- and dentine-caps than the corresponding temporary tooth. The papilla is made up exclusively of medullary tissue supplied with scanty blood-vessels, none

of which could be seen clearly in the specimen from which the illustration was taken. Both the inner and the outer epithelium were plainly visible. The enamel organ is much less advanced in the formation of myxomatous tissue, especially at the point of re-curved of the epithelia, than in the temporary tooth.

The lateral temporary incisor has a papilla much longer than that of the central; at the same time it is of a more cylindrical form, otherwise of a structure identical in all respects. On the top of the papilla we notice a rounding labial, and a sharply-pronounced angle at the lingual portion. We observe a row of odontoblasts only at the central portion of the labial surface, at the summit, and the upper two-thirds of the lingual aspect, while the rest of the surface is occupied by a medullary tissue destitute of fibrous elements, the same as in the central incisor. The dentine-cap is considerably broader than that of the central incisor, and extends farther down upon the labial surface. It, of course, forms a decided angle at the lingual portion of the top of the tooth. The border-line between the non-calcified and calcified portions of the dentine is more conspicuous by the presence of globular deposits of lime-salts than in the central incisor. The enamel-cap is of about the breadth of that of the central, and strictly follows, in its general contour, the dentine-cap. A pronounced feature in this tooth is the medullary tissue occupying the space between the row of ameloblasts and the surface of the tooth. The myxomatous enamel-organ in both temporary incisors does not show a well-developed reticulum, but in its stead a finely granular protoplasmic mass. Obviously a stage of development of the myxomatous reticulum is progressive formation.

The lateral permanent incisor has an oblong papilla, notable for the abrupt stopping of the enamel- and dentine-caps at the lingual aspect, and also for the precipitous lingual portion of its upper half. The blood-vessels are comparatively few in number, traversing the medullary tissue of the papilla. A fully-developed row of odontoblasts is to be seen only at the lingual and posterior cutting-edge; the rest of the cutting-edge is mostly destitute of these bodies. The rest of the papillary surface shows only rows of medullary corpuscles tending towards the formation of odontoblasts. A conspicuous feature in this specimen is the difference between the points of recurvation of the epithelia, which at the labial aspect embraces quite a portion of the bottom of the papilla; while at the lingual it barely reaches down one-half its length.

The temporary cuspid has a papilla which, it will be observed, is somewhat triangular in shape, with a sharply-pointed apex, and

irregularly rounded at the base, with the lingual portion extending down slightly beyond the labia. The structure of the papilla does not materially differ from that of the incisors, the amount of capillaries also being about the same. A row of odontoblasts is observable only at the lower portions of the surface of the tooth, on the labial and lingual aspects. The summit is occupied by a well-pronounced myxomatous, the rest of the surface by a medullary tissue. The dentine-cap is very broad and sharply pointed at its summit. It extends far down along the surface of the papilla, more so anteriorly than posteriorly. The non-calcified position is decidedly narrower, and the globular boundary-line less pronounced than in the incisors. The enamel-cap is likewise very broad, stopping short of the dentine-cap, and is regularly developed in every respect.

The sections obtained from the cuspids were so perfect that they could be utilized advantageously to assist in settling certain moot questions as to the development of dentine and enamel. In the first place, the odontoblasts have, since their discovery, been considered by the majority of histologists as the dentine-formers proper.

It was Heitzmann and Bödecker, in their above-quoted article, who first denied the direct transformation of odontoblasts into dentine, but claimed that they are first broken up into medullary corpuscles, at their distal ends, which become infiltrated first with a glue-yielding basis-substance, and afterwards with lime-salts, and that the offshoots of the original odontoblasts, being the dentinal fibrillæ, ran between the calcified medullary corpuscles, in their respective canaliculi. Every odontoblast sends off one or more fibrillæ. This fact, with some observers, renders the formation of the basis-substance not clearly understood. So great, indeed, has been the difficulty that E. Klein, of London, and R. R. Andrews, of Cambridge, have resorted to specific fibre-cells for the production of these fibrillæ, whilst the odontoblasts proper produce the basis substance.

This view was met at the time by a demonstration, showing that the "fibre cells" were wedge-shaped odontoblasts, and most numerous where the odontoblasts are arranged in a sharply-curved line, especially at the summit of the papilla. In the pig's fœtus, for instance, the summit of the papilla is occupied almost exclusively by such narrow and wedge-shaped odontoblasts. The difficulty is, however, easily overcome by the demonstration of medullary corpuscles at the periphery of the papilla, directly beneath the already-formed dentine. In my specimens, especially the cuspid, one is

struck by the scantiness of rows of odontoblasts and the presence of medullary elements in their stead; one row being visible on a portion of the labial, another on a portion of the lingual surfaces only. Not infrequently the odontoblasts are arranged at acute angles to the dentinal canaliculi. This feature possibly may be attributed to the hardening process, and the subsequent disfigurement by shrinkage, although good reasons may be adduced to the contrary, as the specimens are so perfect in all other respects. The greater area of surface of the papilla is occupied by a medullary tissue, claimed to be the dentine-former proper. In our cuspid the summit is occupied by a myxomatous tissue, approaching in gracefulness almost that of the enamel-organ. Between this myxomatous tissue and the border of the non-calcified dentine clusters of indifferent or medullary corpuscles are seen, arranged longitudinally along the surface of the papilla, therefore not as yet arranged for the formation of dentine. Beneath the myxomatous tissue we find vascularized myxo-fibrous tissue, constituting the main bulk of the papilla. Professor Ebner, of Vienna, in the "German Hand-book of Dentistry," 1891, by Scheff, Jr., claims that we have interrupted poorly-preserved specimens when we speak of medullary corpuscles as the dentine-formers. In view of this assertion, I will draw the gentleman's attention to those illustrations taken from perfect specimens, and ask him how he can account for the absence of odontoblasts, and in their stead, medullary tissues. Obviously there is a series of tissue-changes preceding the appearance of dentine, and one of the links in the chain is the odontoblast. At the lateral portion of the cuspid the question of the formation of enamel may possibly be settled.

Between the fully-developed enamel and the row of ameloblasts there is a broad layer of medullary tissue, considerably broader, indeed, than in any specimen of developing human teeth I have ever seen before. Ebner militates against the view "that the ameloblasts are not direct enamel-formers, but only transient formations, originating from a coalescence of medullary corpuscles, before the appearance of enamel-tissue." Can he or any one explain, may I ask, the composition of enamel-prisms of square or many-sided blocklets (admitted by all observers), except by the construction of each enamel-rod by a succession of medullary corpuscles, infiltrated with lime-salts?

It is unnecessary for me to state here that I seriously object to the assertion of Ebner, or any one else, that our specimens were or are imperfect, the greatest care having been taken in their prepara-

tion, and I can vouch for their perfection. With equal propriety I might ask the learned professor why it is that his specimens were so perfect as to not show the fibre between the enamel-prisms, nor the medullary tissue between the ameloblasts proper and the formed enamel.

The permanent cuspid has a papilla considerably broader than that of the temporary, so much so that it could be illustrated entirely only with a power of twenty-five diameters. The labial aspect is far more bulky than the lingual, the former being precipitous, the latter more tapering. It is composed of medullary, without the slightest admixture of myxo-fibrous or fibrous connective tissue, at the same time being poorly supplied with blood-vessels. Both the dentine- and enamel-caps are as yet narrow, terminating upon the labial side abruptly, an apparent stricture presenting at their termination, beyond which the papilla bulges considerably, while on the lingual side the dentine- and enamel-caps follow the unbroken line of the papilla.

The first temporary molar, at this stage of development, is of considerable size and importance. It presents in this section two cusps, of which the lingual is quite noticeably higher than the buccal, although the latter is but little less developed than the former. The papilla is a bulky mass of myxo-fibrous connective tissue, abundantly supplied with capillary blood-vessels. Corresponding to the valley between the two cusps, the papilla is narrowest, bulging from this point upward and outward. The summit of the papilla of the lingual cusp is higher and more pointed than that of the buccal. The papilla exhibits a row of odontoblasts, and only at the lower third of the lingual tissue, without a trace of odontoblasts. The summit of the papilla of the lingual cusp exhibits a zone of myxomatous tissue similar to that described in the papilla of the cuspid. The dentine-cap forms a continuous investment around the cusps, being narrow in the valley between them, and slanting towards the base of the papilla, reaching farther downward upon the buccal than upon the lingual side. It is fully developed, and composed of a narrow non-calcified and a broad calcified layer, the broader line between the two portions being more globular in the buccal than in the lingual cusp. The enamel is likewise continuous, fully developed, and calcified, being a trifle broader at the summit of the lingual than at that of the buccal cusp. In the valley between the cusps it appears somewhat broader than the layer of dentine.

The first permanent bicuspid, the product of the bud from the

first temporary molar, at birth corresponds to a temporary tooth four and a half months old. It is cone-shaped and composed of medullary tissue, with but scanty capillary blood-vessels at the base of the cone. As a matter of course, there is not even a trace of odontoblasts visible. The papilla is covered with a layer of columnar epithelia, the so-called inner epithelium of the enamel-organ, not as yet transformed into ameloblasts.

The point of recurvation of the inner into the outer epithelium is deeper down upon the buccal than upon the lingual aspect of the papilla. The outer epithelium is still recognizable as being composed of short columnar epithelia, surrounded by fibrous connective tissue. Between the inner and the outer epithelium there is a well-developed myxomatous reticulum, *the enamel-organ*. The intermediate layer is present, though as yet little pronounced. In the specimen from which the figure is taken, the upper portion of the enamel-organ is torn and partly missing.

The second temporary molar has in our specimen two well-developed cusps, of which the lingual far surpasses in size the buccal. This will, as a matter of course, not show the relation between the two cusps with certainty, since it is quite possible that the lingual cusp was caught by the knife at its centre, therefore at its greatest height, while the buccal cusp may have been taken in a more peripheral portion, and thus appear smaller than it really is. Between the two cusps there is an elevation covered only by dentine, which likewise may represent a cusp cut near its periphery. The papilla is mainly myxo-fibrous connective tissue, and freely supplied with blood-vessels. Rows of odontoblasts are seen only at a small portion of its periphery. The height of the papilla is three times greater at the lingual than at the buccal portion. A striking feature is the sharp boundary-line at the lingual aspect, between the papilla, covered with dentine, and that without it, and the bulging out of the latter. The dentine-cap is present all over the upper surface of the papilla, somewhat broader at the summit of the lingual cusp than on the summit of the buccal. It is a trifle broader at the height of the central elevation than in the valleys either side of it.

The difference between the calcified and the non-calcified portions of the dentine is quite marked. There are two enamel-caps, formed one over each the lingual and the buccal cusp; the former being almost twice the breadth of the latter.

The second permanent bicuspid is still younger in its development; it corresponds to a temporary tooth in the fourth month of

embryonal life. The papilla is a blunt cone divided into a conical upper portion, surrounded by the inner epithelium, and a broad base surrounded by fibrous connective tissue. The papilla is made up altogether of medullary tissue, and shows blood-vessels at its base in small numbers. The inner epithelium is quite conspicuous by the column of its constituent elements. The same elements also produce the row of outer epithelia, which appear shortened only at the summit of the enamel-organ. The enamel-organ itself is not as yet fully developed, its points of intersection being large, the meshes, on the contrary, narrow. The intermediate layer is but little pronounced. In this specimen the enamel-organ was unbroken.

The first permanent molar is an unusually well developed tooth in our series. It has two well-pronounced cusps, the largest being the lingual. The papilla is composed mainly of myxomatous and medullary tissue, with an admixture of some delicate fibrous connective tissue. Its vascular supply is as yet scanty. It shows deep incisions on both the lingual and the buccal aspect, corresponding to the dentine-caps, beneath which the papilla bulges quite noticeably. Rows of odontoblasts are seen along the greater extent of the papilla; especially is this the case upon the lingual aspect, which shows an uninterrupted row of these formations. A second row is seen in the valley between the two cusps, where there is as yet no dentine formed. There are separate dentine-caps for each cusp, that over the lingual cusp being especially well developed.

The enamel-caps are, as is the rule in all developing teeth, shorter than the dentine-caps, that of the lingual cusp being at its summit twice as thick as that upon the buccal. The row of inner epithelia is transferred into ameloblasts over both cusps, and there is a distinct layer of medullary tissue present between the ameloblasts and the fully-developed enamel. The outer epithelium begins to break up at its upper portion, where the enamel-organ forms a broad layer of myxomatous tissue.

Huxley (*Quarterly Journal of Microscopical Science*, 1853), as early as 1853, says, when speaking of the development of dentine, "that it is not explicable by the cell theory." How true this statement, made so many years ago! We do not, however, agree with his assertion that the pulp-tissue takes no part in the formation of dentine. Any one considering the so-called cells as stable and unchangeable formations will be at a loss to explain the formation of any tissue of the teeth. The latest researches in histology have proved that as far as the morphological elements are concerned there is nothing stable during the advancing formation of the organism and its con-

stituent parts, nor during full development, at the height of life; and far less is this the case during its decline. Before a tissue is fully formed there are repeated oscillations forward and backward in the appearance of morphological elements, the intervening stage being their reduction into the stage of indifferent medullary or embryonal tissue. It has been proved that the papilla of the developing teeth may proceed to the formation of myxomatous, nay, myxo-fibrous connective tissue. At its periphery this tissue, sprung from medullary corpuscles, falls back to medullary corpuscles, which unite into large branching protoplasmic bodies, resembling columnar epithelia, the so-called odontoblasts. These are by no means the dentine-formers proper, no more so than that osteoblasts are the real bone-formers. Both these formations are nothing but a pre-stage towards the formation of either dentinal or bone-tissue. Odontoblasts break up once more into medullary corpuscles, from which at last, by their infiltration with basis-substance and immediate deposition of lime-salt, they are first non-calcified, and at last calcified into dentine. The zigzag line of development of dentine, therefore, is first embryonal or medullary tissue; second, myomatous or myxo-fibrous tissue; third, embryonal or medullary tissue; fourth, odontoblasts; fifth, again embryonal or medullary tissue; and sixth and lastly, non-calcified and calcified dentine.

Every reduction to embryonal tissue is followed by a step in advance in the development of the organ, until at last the most perfect tissue, such as dentine, will make its appearance. It is a question in my mind whether the dentine as we see it at the time of birth is a lasting formation, or the same as we see it in the fully-grown temporary or permanent tooth. The size of the papilla and the dentine-cap are at birth far too small in comparison with what we see at the time of eruption. It is quite possible, therefore, that the first-formed dentine-cap is not lasting, and may eventually be reduced once more into medullary tissue, before the permanent breadth of dentine corresponding to the transverse diameter of a fully-formed tooth is reached. Similar oscillation must, of necessity, take place in the production of the pulp and the dentine of the roots. At the time of birth only the papilla of the crown is present, sharply bordering downward by fibrous connective tissue. This latter tissue is reduced to its embryonal condition in order to produce the necessary material for the production of the dentine of roots. Future observations will be required in order to settle the question as to how the dentine and cementum of the roots are formed.

The same puzzle we meet with in the history of development of

the enamel. At the time of birth the myxomatous enamel-organ is far too small to enable us to understand the formation of a broad enamel-layer, such as we see at the time of eruption. Even the first established enamel-caps are far too small in comparison with the diameter of the crowns of either temporary or permanent teeth. Heitzmann and Bödecker, in their above-quoted publication, the result of eight years' hard labor, came to the conclusion that the elements of the original epithelial pegs are reduced to medullary tissue, afterwards to fibrous connective tissue, next to medullary tissue, and eventually to ameloblasts. Ameloblasts, according to their notion, are not direct enamel-formers, no more than odontoblasts are direct dentine-formers. The ameloblasts are reduced to medullary corpuscles, which after infiltration with the basis-substance, and immediate deposition of lime-salts, at last produce enamel-prisms.

From a study of their specimens and my own I am convinced that these views are correct.

Should the first appearing enamel-cap prove too small for a full-grown tooth, nothing is left to solve the puzzle of development but the assumption that even the foetal enamel-cap is not lasting, and must undergo reduction or possibly repeated reductions to medullary tissue before it reaches the extent of a fully-developed tooth, such as we see at the time of eruption.

CONCERNING VARIOUS METHODS ADVOCATED FOR OBTAINING THE NECESSITY OF EXTRACTING DE- VITALIZED TOOTH-PULPS.¹

BY DR. W. D. MILLER, BERLIN, GERMANY.

THE practice now in vogue among good practitioners, of thoroughly removing the pulp and filling the root-canal to the apex, is usually so easily carried out in the incisors and cuspids, and gives such sure results, that there is no probability that a better method will ever be found. But when we extend this treatment to the bicuspid and molars, the labor and expense entailed are frequently so great as to put it beyond the reach of the great majority of the human race, and the method is not always successful. It will conse-

¹ Abstract from Dr. Miller's paper read before the World's Columbian Dental Congress, Chicago, August, 1893.

quently be a great boon if some means or method can be devised which would render unnecessary the removing of the pulp and filling the root-canals of molars.

While every dentist has now and then knowingly left remains of the pulp in narrow and tortuous canals, or in canals obstructed by calcific matter, and while many dentists in Europe have contented themselves with simply devitalizing the pulp, filling over it with amalgam and *leaving the rest to nature*, the first *systematic* attempt to do away entirely with the necessity of extracting the root-portions of the pulp appears to have been made by Witzel, who in 1874 presented the view that an application of arsenous acid carefully made to the inflamed pulp devitalized only the diseased tissue, and that by amputating the coronal portion of the pulp twenty-four hours after the application, the ends of the root-stumps might be treated as healthy, freshly-exposed pulps.

Dr. Miller then presented briefly the methods devised by Witzel, Baume, and Herbst, the latter as put forth by its author and as modified by Bödecker, and summarized their advantages and disadvantages. Continuing, he said,—

Perhaps the majority of dentists have also made more or less extensive use of the method recommended by Bödecker when they have left a portion or the whole of the pulp in the buccal roots of upper or the mesial roots of lower molars, and filled directly over them, after thoroughly bathing them with carbolic acid or some other antiseptic.

I have for a long time felt that the solution of the problem was to be sought for in the direction pointed out by Witzel, except that our efforts should be directed not to retaining the vitality of the root-stumps, but to preventing their subsequent decomposition by impregnating them with a suitable antiseptic. I am convinced that the success of the impregnation method depends to a very great extent upon the character of the antiseptic employed, and upon its chemical action upon the pulp apart from its antiseptic action.

The qualities desirable appear to me to be,—

1. It must be a strong antiseptic.
2. It must be sufficiently soluble and diffusible to guarantee the impregnation of the whole pulp.
3. It must not be so diffusible that it will be completely taken up by the surrounding tissue and finally disappear altogether, as is the case with applications of carbolic acid. It is my impression that there is greater danger in too great solubility than in insolubility.
4. A coagulating action upon the tissue of the pulp appears

desirable, though not absolutely essential. A pulp which is coagulated into a hard, insoluble body is less likely to furnish nourishment for bacteria and offer irritation to the periapical tissue than one in a soft or semi-liquid condition. One cause of the failure of Baume's borax treatment is probably the conversion of the pulp into a liquid or semi-liquid, soapy mass with a strong alkaline smell and reaction, which can hardly be indifferent to the tissue about the apical foramen.

5. It is desirable that the substance employed have no irritating action upon the pericementum.

6. It should not discolor the tooth, although, as the treatment concerns chiefly molars, a slight discoloration need not be considered as a very serious matter.

7. Solid substances are better adapted to the purpose than liquids.

It is difficult to find a substance which fulfils all the above-mentioned conditions.

According to the results obtained from over five hundred experiments, I have divided dental antiseptics into three groups,—

1. Those possessing in a high degree the power of imparting antiseptic qualities to root-pulps, such as cyanide of mercury, bichloride of mercury, diaphtherin, sulphate of copper, salicylate of mercury, oil of cinnamon, ortho-kresol, carbolic acid, trichlor-phenol, chloride of zinc. The last four are, however, decidedly inferior to the others; they penetrate the pulp very rapidly, chloride of zinc surprisingly so, but they are lacking in the necessary powerful antiseptic qualities, and are so diffusible that in the course of a few weeks they disappear altogether from the pulp.

2. Those of doubtful value: Thymol, salicylic acid, eugenol, campho-phénique, hydronaphthol, A and B naphthol, aceticotartrate of aluminum, and some essential oils, resorcin, thallin, sulpho-carbolate of zinc, oil of birch, iodide of sodium, nitrate of sodium, etc.

3. Those nearly or quite worthless: Iodoform, basic aniline coloring-matters, borax, boracic acid, dermatol, eucrophen, chloride of lime, peroxide of hydrogen, sozoiodol salts, iodol, tincture of iodine, spirits of camphor, naphthalin, etc.

The attempt to apply these results to practice was first made with the bichloride of mercury, which has been used since 1890 in some four hundred to five hundred cases, first in the form of small tablets, having the composition,—

Sublimate, 0.01 gramme;
Boracid acid, 0.02 gramme.

Or,

Sublimate, 0.01 gramme ;
Common salt, 0.02 gramme.

The pulp having been completely devitalized, the pulp-chamber was thoroughly opened and cleansed, and a tablet applied and slightly crushed with an amalgam plugger, moistened with water and covered with a layer of tin-foil (I now use gold-foil), and the amalgam or cement filling immediately inserted. In about thirty per cent. of the cases severe pain occurred on the day following the application, and on account of this disagreeable symptom these tablets were abandoned and the following substituted :

Sublimate, 0.0075 gramme ;
Thymol, 0.0075 gramme.

These are applied in the same manner. The thymol being chiefly designed to prevent the sublimate being so rapidly absorbed, besides giving a greater permanency to the application, by reducing its solubility. Very seldom, so far, has pain followed the use of these tablets, while experiments out of the mouth show that they still possess sufficient penetrating power.

Another combination employed is,—

Sublimate, 0.005 gramme ;
Thymol, 0.005 gramme ;
Tannin, 0.005 gramme.

This combination is somewhat empirical, though the design of the tannin will be apparent to every one. The combination does not penetrate as rapidly as No. 2, and discolours the tooth more.

Cyanide of mercury has also been employed in combination with thymol, in the following form :

Cyanide of mercury, 0.0075 gramme ;
Thymol, 0.0075 gramme.

Also the salicylate of mercury in the same form. This I think deserving of a trial. Its sparing solubility justifies the belief that its action will be more permanent than that of sublimate. The sulphate of copper may be used in pure form, but it naturally causes serious discoloration of the tooth at the neck, and is also, I fear, too soluble to give permanent results, in pure form. More recently, I have directed my experiments towards the discovery of some substance which possesses the desired qualities without discoloring the tooth. Thus far I have obtained the best result from diaphtherin

(oxyechinaseptol), an antiseptic recently introduced by Emmerich. It may be applied in pure form. Among liquid antiseptics, the oil of cinnamon takes the first place, and I have much faith in its power to conserve the dead pulp. Like all the liquids, however, it is difficult to apply, and has, besides, the disagreeable quality of discolored the tooth yellowish-brown. The combination which I have chiefly employed is that of sublimate and thymol. (I have not had opportunity to sufficiently test the others in practice, though I am now using, by way of experiment, the salicylate, and, to some extent, the cyanide of mercury.) It has been employed at the Dental Institute of the University of Berlin in over two hundred cases. Of these, only one failure has come to my knowledge.

Time is the only test for methods like those under consideration, and we can scarcely expect to arrive at a definite conclusion in less than five to ten years. Nor should we be hasty in the application of methods of this nature. One or two cases every month, at least for the first year or two, is all that a careful dentist ought to risk in private practice. Cases should be chosen which are very difficult to treat and which are otherwise frequently treated by the forceps, such as distal cavities of second or third molars, buccal cavities of third molars, etc. It is not possible at present to form a reliable estimate as to the value of this method of treating teeth; it may also be that much better materials will be found for the purpose than those suggested above. There are, at least, reasons for believing that by a careful application of this method many teeth may be saved which otherwise would be sacrificed to the forceps, or, what is much worse, be allowed to crumble away.

[The President exhibited two small bottles containing the preparations which Dr. Miller had recommended, and passed them around for inspection.]

AMONG THE ANCIENT HAWAIIANS.¹

BY J. M. WHITNEY, D.D.S., HONOLULU, H. I.

To the thoughtful and conscientious dental student and practitioner there must constantly arise questions satisfactory answers to which he may look in vain for in his common surroundings. He

¹ Read before the World's Columbian Dental Congress, Chicago, August, 1893.

sees the ravages of dental caries and other diseases so almost universal in our day, and he asks, Is this a necessary evil to which all mankind is subject? or is it a result of the artificial life and varied foods to which our modern civilization binds us? Is dental irregularity due, as some claim, to the mixture of races, and if we could find a people homogeneous and simple, would these conditions exist? Is it true that as mankind advances in the stage of being the third molar is to become gradually eliminated? What is the normal position of adjacent teeth in relation to each other? What relation has the kind of food we use to the building up of dental structure?

We all know the difficulty, amid the complication of modern hygienic conditions, of answering these important questions to our own satisfaction. But if we can examine the dental organs of a simple and isolated people, not affected by the vices and diseases, which are surely not necessarily a contingent of civilization, but which are sure to follow in its train, we may draw some conclusions which will throw much light on our problems. It would be difficult, indeed, for most of us to find living subjects in any number meeting these conditions. But fortunately the bony structures are preserved long after the owners of them have passed beyond mortal ken, and if we can obtain the crania especially of people who, living upon the earth ages ago when wants were few and means of supplying them were correspondingly limited, our study of their dental conditions will certainly be interesting and ought to be instructive.

I consider myself especially fortunate in living in a land where both of these requirements are met; first, the native Hawaiian people, until within a hundred years, lived isolated and unknown to the great world, therefore their habits were simple and their wants and opportunities were few; second, their modes of burial were such that it is possible with comparative ease to obtain some knowledge of their primitive conditions.

"The most isolated place on the globe," that is what Professor Alexander, the learned historian and ethnologist, says of the Hawaiian Islands. Two thousand miles from the Pacific coast of America, and equally distant from the Micronesian, Samoan, and Tahitian groups, the nearest inhabited islands, and more than twice as far from the east coast of China and Australia, they occupy a unique position on the map of the world.

About the year 500 of the Christian era a boat-load of men and women drifted to these shores, either from the Malay Archipelago or from one of the southern islands which had previously been

settled by Malays. Except a short period of intercourse between the Pacific Islands in the eleventh and twelfth centuries, these islands were scarcely known to the world until their discovery by Captain Cook, about a hundred years ago. Even the slight intercourse that may have existed during these twelve centuries must have been among kindred races on the Tahitian and Marquesan Islands, so that practically this people (until within a hundred years) had not changed their race, characteristics, nor their habits of life during the twelve hundred years of their existence. Fortunately, enough of their history and customs have been preserved to give us a good idea of many of their characteristics, their food, etc. They were of medium height, rarely reaching six feet, with heavy strong bones, their crania large and thick. Their employments were tilling the soil, fishing, and warring. Their games were hurling the spear, riding the surf-board, boxing, wrestling, and other exercises requiring great bodily strength and courage.

The climate at the sea-shore averages 75° , with slight variation from day to day, and not varying more than 30° during the year, while as one ascends the lofty mountains with which the country abounds any climate may be found to one of perpetual snow. Thus excessive heat is never found, and vigor of body can be maintained. In the former days of which we have been speaking such diseases as typhus, typhoid, malarial, and scarlet fevers, whooping-cough, measles, mumps, small-pox, syphilis, and leprosy were unknown. Diseases of the alimentary canal and of the lungs were the most prevalent troubles.

Their animal food consisted mainly of fish, with which the sea abounds. Domestic fowl were common, with dogs and swine, both of which were choice articles of food. Of vegetable foods the principal then as now was the *taro* (*Colocasia antiquorum*), which is the Hawaiian "staff of life." From it is made the *poi*, an acid paste, without which a meal is never quite satisfying. They also had yams, sweet-potatoes, and sugar-cane. Their common fruits were cocoa-nuts, bananas, bread-fruit (when cooked resembling sweet-potato), and *ohia*, or mountain apple. Their habits of eating were most irregular, often neglecting to supply themselves with food for several days, and then gorging themselves at any hour of the day or night.

With the incoming of civilization of course many of these conditions have changed. Though *poi* and fish are still the favorite articles of food of the native people, they have added to these many acid and subacid vegetables and fruits, with meat, fine flour, etc.

The second peculiarity of this people rendering a knowledge of their early physical conditions possible is their modes of burying their dead. The most ancient and favorite of these places of interment were in the old lava caves, with which the island of Hawaii particularly abounds. A lava stream flowing from some opening on the mountain-side would cool first on the surface, leaving the still flowing lava within to empty itself on the country below, and thus a long irregular cave of varying dimensions would be formed. Many of these open from mountain-sides, and often from apparently inaccessible precipices. The ancient Hawaiians were very superstitious; the ghost of the dead was supposed to haunt the body long after death, and the friends of the dead anxiously sought the most remote and inaccessible places for depositing their bodies. The islands were teeming with people, and some of these caves are piled many feet deep with the bones of the ancient dead. No wind nor moisture ever reaches them, and the bones are as perfectly preserved as in our most carefully-kept cabinets, after probably hundreds of years since their interment. But the natives even now guard the burying-places of their ancestors with most jealous care, and it is not easy even to one familiar with them and their language to obtain access to these ancient sepulchres.

The other mode of burial to which I referred, and which I consider to be much more recent than that of the caves, was in the sand of the sea-shore. Until within a comparatively few years specimens of crania and other bones from these burying-grounds could be obtained readily in many places. Six or eight miles from Honolulu there was such a place twenty years ago, where for several miles on the sea-shore these human remains lay bleaching in hundreds under the tropical sun, until they had attained the color and texture of ivory. I have seen several similar places on the island of *Oahu* and on *Kauai* particularly, but they have ceased to exist. In some places the grass has grown completely over the sand-mounds, and cattle pasture over whatever bones may remain buried beneath. In others the native people, jealous of their removal, have taken care to break and demolish the skulls, thus rendering them useless. And the South-Sea-Island laborers have sought everywhere for the skulls and removed the teeth for the purpose of making necklaces of them, of which they are very fond.

Realizing more the value of these ancient remains now that they are so difficult to obtain, I recently spent a week on a journey to the island of Hawaii for the purpose of visiting some of these lava

caves and securing, if possible, some of their treasures. I was fortunate in being able to obtain the assistance of a friend whose knowledge of the native people and their language made him especially valuable, and I may say indispensable to my success. A voyage of perhaps two hundred miles from Honolulu brought us to the vicinity of the caves. Providing ourselves with candles, stout cord, etc., we at once engaged the service of an old native who claimed to know all about the object of our search, and spent the first day in a vain endeavor to find the ancient cave. Whether the native knew less than he had professed, or whether at the last his courage failed, and he feared the result of guiding us aright, we did not know, but we suspected the latter reason was the true one.

The next day we secured two guides, and after riding many miles over rough lava-covered land we reached a spot which our guides pointed to us as the entrance to a burial-cave. It was near the sea-shore, far from any human dwelling, and from any place that could support a habitation. We could not believe at first that an opening could exist there large enough to admit a man's body, but with much labor we succeeded in removing the rocks so that by considerable effort we were able to force ourselves through. Leaving our unwilling guides at the entrance, we fastened a cord securely to the opening of the cave, lighted our candles, and proceeded to work our way down. Descending among the rocks until we were at least fifty feet below the surface, we suddenly entered a large room, perhaps forty feet high. There were no bodies here, but opening from this room on several sides there were low, narrow passages. Entering one of these, we followed it for, perhaps, a quarter of a mile. Part of the way we were obliged to crawl with great difficulty through the narrow tunnel. We were finally rewarded by again suddenly finding ourselves in a large room, and surrounded on every side by the objects of our search. Near the entrance some of the bodies lay as if hastily deposited, but most of them were laid away with care, some upon shelves partly made with sticks laid in the rock at the side of the cave, more in an opening at the side, which the remains of a stone wall showed to have been at some time walled off from the rest of the cave, while the dim light of our candles showed us several openings in different directions which doubtless led to other similar burial-caves.

The knees were usually drawn up to the breast, tied with a cord, and the whole wrapped in many folds of the native cloth or tapa. By the side of each had apparently been left some food, and

perhaps his fish-hook or spear, that he might not want for food in his future home. The air being very dry, and perhaps having some antiseptic property, many of the bodies were completely mummified. Deep dust lay upon everything, and the stillness of death was over all. We could easily imagine with what awe the friends of those lying here had crept down at night and laid away their dead. For the greatest secrecy must be observed, so that no one could ever find them. "I do not wish," said a dying chief, "that my bones should be made into arrows to shoot mice with, or into fish-hooks."

We secured as many specimens of crania only as we were able to carry, packing them in bags. It was growing dark when we emerged from the cave; and when our natives who were waiting outside saw our bags of bones and realized that they must help us to carry them home, they were in utter consternation. It was with difficulty that they could be persuaded to place them upon their horses, and then, regardless of us, of road or path, they took the shortest way home as fast as their horses could carry them, not daring to look behind, lest they should see the pursuing ghosts of their ancestors, leaving us to pick our way as best we could over the rocks in the dark, without even a path, the eight or ten miles to our lodging-place.

We have been taught that primitive peoples, living in simple conditions, were in a great measure free from dental caries as we see it in the mouths of our patients, and that many of the forms of dental disease with which we have to contend were with them wholly unknown. This seems to me a mistaken teaching, as far as may be learned from these records. An exceptional opportunity of becoming acquainted with the crania of the ancient people of these islands during the twenty-four years of my residence here has convinced me that both in the case of those buried in the caves and of those more recent in the sand, not more than twenty-five per cent. have been free from caries, irregularity, or disease. Indeed, I think I have discovered every form of dental disease known to our practice; dental caries in all its many types, necrosis of the teeth, erosion, alveolar abscess, pyorrhœa alveolaris, disease of the antrum of Highmore, necrosis of the maxillary, ankylosis of the jaw, salivary calculus, etc.

Here was a well-developed osseous system; the individual was trained to exercise of the kind that would develop every part of the structure. Living upon an abundance of the simplest yet the most nutritious and bone-developing foods that would not cling to the

teeth, but would exercise and clean them, with not an element lacking required by our present knowledge, and yet the same dental disease which we suffer burdened the life of the ancient Hawaiians.

While this is true, I have been interested to find that the teeth of those who died before civilization had introduced to the people peculiar constitutional diseases, acid fruits and vegetables, fine flour, and varied foods, were much less seriously attacked by disease than afterwards. As a general statement the teeth would be found clean, and when caries existed it was here and there in teeth of both maxillaries and on both sides, but not so pervading as found in the more recent crania, or in the mouths especially of the young of the present time.

We have often accounted for the irregularity of teeth found so commonly among Americans by the mixture of races of which our nation is composed. We say that the wide teeth of the large jaw of one race, being crowded into the narrow jaw of another race with which it has mingled, would of necessity produce an irregular arch. But here is a people, isolated from all others for at least fourteen hundred years, with no admixture of races; yet irregularity of the teeth of both maxillaries was almost as common as it is among the mixed races of to-day. It would be difficult to give a good reason why a fixed type for the mouth of this people should not have existed a thousand years ago, and that all with rare exceptions should have been modelled from it, had Nature designed that there should be absolute uniformity in her work.

Among the crania I have examined I have noticed what seemed to be somewhat fixed as a type, that the teeth are set closely together and well rounded, and that the dense part of the enamel, near the cutting-edge or grinding surface, strikes its fellow at that point, the whole being held firmly together by the buttressed third molar.

Perhaps next to dental caries, the greatest source of oral disorders among these people was the irregularity of the third molar, often producing in them as serious consequences as with us of the present time; while its failure to erupt was nearly or quite as common as we find it in our daily practice. So that we cannot argue from these remains, at least, that the coming man is to be deprived of this useful organ.

The relation of food and disease to the health of the dental organs is strongly brought out as we study the changes shown in the teeth of those buried in the oldest caves, and so down through the more recent burials in the sand; then of those who were the

old people a quarter of a century ago, whose childhood was passed before civilization had touched their life-habits; and their grandchildren who are now in our schools. These children, as shown by actual examination, have but little better teeth than their white school-fellows. Their fathers and mothers may have better teeth than the children, but it would be an exception if they had not been to the government physician and had one or more teeth removed for relief from odontalgia, while the grandparents, the old men and women whom I found when I first went to the islands, had teeth approximating those found in the old caves, though not as good.

I lay much of this very great change to the many forms of disease that have weakened their constitution, to fine flour that has become a part of their diet, and, eaten in the form of crackers or hard bread, clings to the teeth; to the many acid fruits, such as tamarinds, guavas, limes, etc., to which they have constant access, and to spending their childhood and youth in the school-room instead of wading and swimming in the warm sea, eating raw the fish and shell-fish which they have caught, chewing sugar-cane, and stripping off with their teeth the fibrous covering of the cocoa-nut.

Dr. Whitney stated, after reading his paper, that he had many specimens of crania in which the third molar was not erupted, and he had found that it was as frequent among the ancient Hawaiians not to erupt that tooth as among his present patients.

ENGLISH TUBE TEETH: THEIR USE IN PLATE-, CROWN-, AND BRIDGE-WORK.¹

BY JOHN GIRDWOOD, L.D.S. (EDIN.), D.D.S. (UNIV. OF PENNA.), EDINBURGH, SCOTLAND.

THE absence of a detailed description of the method of using tube teeth from any of the standard American works on operative or mechanical dentistry has long been a subject of surprise to me. It still puzzles many of the leading dentists in Europe, and particularly in England, where tube teeth are still largely used, and found,

¹ Read before the World's Columbian Dental Congress, Chicago, August, 1893.

where judiciously employed, superior to flat teeth, to know why the system universally practised here before the introduction of vulcanite should have failed to attract any notice in America.

The present seems a fitting time to bring before you this subject, especially when we know that in crown and bridge-work, specialties indigenous to America, these teeth have a new field opened to them.

The English tube tooth differs from the flat favorite in one essential.—viz., that its attachment to the piece to which it is adjusted is effected by means of a central tube (running through the body of the tooth), and into it a pin or post is introduced.

Before proceeding further, it may here be well to set before you a few of the advantages claimed for tube over flat teeth.

First. Although adaptable in any situation on both jaws, they are specially superior as masticators. They are much stronger than their flat rivals. The tube tooth is supported over its whole lower surface, and the greatest strain in occlusion falls mostly in a vertical direction upon the crown, whereas in a flat tooth the impact of the bite is more evenly distributed.

Second. They allow of easy removal for repair.

Third. In soldering the backings of flat teeth to the plate, the danger of warpage is great. By the use of tube teeth this risk is entirely removed.

Fourth. They are more adaptable; a very long tooth can be cut down to any length, and, the body being of the same texture throughout, can be ground and polished perfectly.

Fifth. They can be used for plate-, crown-, and bridge-work, and in some cases in combination with vulcanite. From their ease of adaptability, a small stock of these teeth goes a long way. Hence they are cheaper.

Sixth. Being a more faithful reproduction of the teeth they replace, they feel more comfortable to the tongue, and are less bulky.

Seventh. They are more easily kept clean, because backings are done away with, and better supports substituted, which being surrounded by porcelain are out of the reach of any impurity.

For crown- and bridge-work they have all the advantages already enumerated, and, in addition, they can be more perfectly and directly fitted to the root than any other form of porcelain crown. They retain when mounted for wear in the mouth their translucency and natural appearance, qualities so often destroyed by the gold backing.

There seems to me, however, to be one defect in the tube incisors and cuspids as at present manufactured. In these the base is frequently too small antero-posteriorly, and, consequently, in many

cases it is impossible with them to cover the root completely. Moreover, the tube is very often too near the front, thus destroying the axis of the crown with its root. The bicuspid and molars, however, are free from any such fault, and are pre-eminently adapted for crown-work.

The application of tube teeth requires the use of a special set of simple hand tools which had best be described here.

A counter-sink for clearing away the burr which forms upon the end of the tube when ground, and for slightly enlarging the orifice of the tube at its base.

A tube file used to remove the *débris* from the tube after grinding.

A marker. This is a piece of straight round wire which should fit the tubes easily, but not loosely, and have one end filed almost to a central point.

A pair of flat-pointed pliers with a longitudinal groove in them for holding the pin while it is inserted in its socket in the plate.

A sharp-pointed graver.

A length of gold pin-wire.

A pot of paint, made by mixing olive oil and vermilion.

Their respective uses will be best described in an explanation of the method of mounting the teeth for which they are required.

For this purpose we shall take, by way of illustration, a partial gold upper, where the lateral incisor and cuspid on the right side and all the grinding-teeth on both sides, except the second right upper molar, are absent. Having struck and fitted the plate in the ordinary way, and fitted the clasp, a tube tooth is now selected for each side. Care must be taken that the teeth chosen shall be longer than is apparently necessary, so that some tooth-substance may be to spare in fitting to the plate and bite. They are now roughly fitted in the positions they will occupy. The counter-sink removes the burr from the platinum tube at its ground end, and the tube file clears out all *débris* from end to end. Having seen that the tube is clean, replace the teeth on the plate and fasten them in their desired positions with hard wax. Now pass the marking wire *tipped with vermilion paint* down each tube till it touches the plate, where it will leave a mark showing the places at which the holes are to be drilled to receive the pins. Remove the teeth from the plate, taking care not to injure the color-mark. This undisturbed, take the sharp-pointed graver and make a slight pit for the drill; do not here take the plate from the model, but proceed to drill the holes for the pins, being heedful to keep the drill in every respect at the same angle as was made by the marker with the plate. By means of a broach the

holes should be enlarged till they are just a little too small to receive the pin-wire full thickness; the rough edge or burr left by the drill must be removed by file and graver, and the hole slightly counter-sunk on both sides. A suitable length of gold pin-wire should now be cut, and the end which is to fit the socket in the plate should be slightly tapered, so as to fit tightly and project a little way through on the palatal surface. A slight groove may with advantage be made longitudinally on the tapered end of the wire, for it assists the solder to run more readily from the palatal to the lingual surface. The tapered end of the pin and the pin-hole are then touched with borax, and the wire fixed firmly in place by means of the pliers, attention being paid to its direction. The tooth is next tried on, and having ascertained that this particular point is correct, we proceed to solder the pins, drawing the solder through from side to side. It is not necessary to invest the plate for this purpose, for the tightness of the pin in its socket will support it sufficiently. In soldering, it is of the utmost importance that the smallest possible quantity of solder be used. When the plate has cooled, the flux is removed by boiling in pickle. From the palatal surface cut off the projecting end of the pin, and smooth it down with corundum wheel and graver till it is level with the plate. Now replace the plate on the model, and file down the pins till they accurately fit the bite. Place the teeth on the pins, and if the latter should have tilted in soldering, it will be at once seen, and may be corrected by grasping the pin close to the plate and bending as required.

Now comes the fine fitting of the teeth, done best with small wheels. Paint the plate where the tooth will touch it, and press the latter gently to place; it does not fit; remove it, and a small red mark will show where it is too long; grind off here, and having used counter-sink and tube file, try the tooth on its pin again, and continue the process of alternate trying on and grinding till a perfect fit is obtained. Now grind the coronal surfaces of the teeth to suit the occlusion of the bite, using the vermilion paint freely. Next set the cuspid and first bicuspid on the right side, and these finished, the first bicuspid on each side serving as a guide, the pins for the remaining teeth may be inserted at one soldering.

The teeth are then polished and the coronal ends of the pins are finished to show a rounded end, or ground to the bite according to the requirements of the case. This done, the plate is finished in the usual manner. Previous to fixing the teeth, a few shallow cuts are made in each pin with a fine file. When the teeth have been properly cleaned and freed from all traces of oil (which can be best

done by boiling them for a few minutes in a strong solution of soda), their tubes are dried by cotton wound round a broach, and their interiors roughened by a clean tube file. The teeth are fixed with sulphur. This material is melted in a small porcelain Berlin cup till it is quite liquid, and is kept in this condition and held by an assistant. The operator himself grasps the plate firmly with the pliers in the left hand, and heats the whole carefully over the lamp. This must be done gradually, and the flame ought not to play on the porcelain. In the right hand he takes a wire spatula, and dipping it in the molten sulphur, conveys it to the heated plate and teeth repeatedly, till a surplus begins to show itself. The sulphur runs by capillary attraction under the teeth and along their pins, and when the whole has cooled it sets hard and the teeth are immovable. The excess of sulphur may be removed with a fine-pointed knife, and the polishing of the plate makes it ready for the mouth.

This description of the method of fitting tube teeth applies in every particular to every case, be it partial or full, upper or lower.

Besides the ordinary tube teeth, single gum teeth of this kind are to be had, and, when judiciously used, they prove as satisfactory as flat-backs.

English Tube Crowns.—In America, during recent years, attention has occasionally been called to English tube teeth in crown-work, although no details of their application have been given. This branch of practice, however, is common enough in England, although the usual method of fitting the tooth to a model, fixing pin and tooth together, and finally cementing them upon the root, is open to many objections.

An improvement made by my partner, Mr. John Stewart, L.D.S., of Edinburgh, is well worth a description. The method is as follows: The root is prepared in the usual manner. If part of it remain above the level of the gum, apply the rubber dam to one tooth on each side before excising, having first anæsthetized the gum by painting on a twenty-per-cent. solution of cocaine. If possible use a ligature in preference to a clamp for fixing the rubber, because the latter interferes with the bite when the pin comes to be adjusted. Push the rubber up as far as you can, for the reason that it is well to have the union of root and crown covered by the gum when the dam is taken off. Now drill the canal with a twist drill a shade larger than the diameter of the wire to be used as a post. If, as often happens in the first bicuspid, the canal be bifid, a piece of wire may be bent to fit into each canal, and to it the straight post should be soldered, or the straight pin may be "kneed" and an addi-

tional "leg" soldered to it. The post may be made of gold, platinum, or English dental alloy; the last I prefer. The post, where possible, should have a fine shallow thread cut on it, except where it emerges from the root to enter the crown. This part should not be impaired in strength even by a screw-thread.

Having selected a suitable tooth, fit it roughly to the root. Place the pin in the root and try on the crown; if it be much out of line with the other teeth, this fault must be put right, by bending the pin or by reaming the canal in the direction necessary, or by a combination of both operations. Now try on the tooth and the pin once more; if everything is right, groove the walls of the canal with a wheel-burr, mix the cement, and, placing a little in the canal and round the pin, force the latter to place with the pliers. While the cement is yet soft take the crown and slightly oil its base; slip it on to the pin, and before the cement sets insure its right position. It had best be held in place till the cement has set. Now, having taken off the crown, trim away the surplus cement from the face of the root. The face of the root may be cut out round the post, and filled with gold or amalgam, if thought desirable. Make the patient close his teeth, and grind the post till it is clear. Now fit the tooth on the root as you would to a plate, but instead of using vermilion paint for fine fitting use a small disk of thinnest articulating paper, and grind off where the tooth is marked by it till a perfect fit is obtained. Next grind to fit the bite margin, remove the excess of porcelain till the sides of root and crown are continuous, and polish. Previous to setting, hollow out the base of the crown, avoiding the edges; this provides for the presence of a body of cement between the root and the crown, as in the Logan and other crowns. Clean out the tube thoroughly and roughen its interior as in plate-work, and fix it with cement, pressing it firmly to place with a Bonwill crown-setter. The head of the pin may be riveted with an engine-burnisher, but do not omit to examine the bite before the patient leaves.

The shaping of the root is a matter of choice. The two which I have found best are the "saddle" and the well-known "New Richmond" shapes. The crown to suit the latter is best fine-fitted by hand, with a three-sided corundum file.

Tube Crowns on Metallic Caps.—If for any reason it is considered advantageous to protect the surface of the root by means of a metallic cap and band, the rubber dam must be dispensed with. Trim the root, making the sides parallel, and, after fitting a collar to it, leaving the gold a trifle high, prepare the canal and insert a post

loosely. Next take a plaster impression and bite of the whole; the pin and band will either come away with it or, should they not do so, they can be easily replaced. Cast and open; fit a coin gold cap, No. 30 thickness, and, having soldered it to the band, through it drill or punch a hole for the pin; next place it on the model, insert the pin, and, when needed, correct its direction by bending before soldering to the cap (the pin will be easily bent if nicked with a file, and as this weakness is repaired by the soldering, it in no way imperils the soundness of the post).

Having boiled in pickle, replace the united pin, cap, and band on the model, and proceed to fit the crown. This done, cement it to cap and pin before inserting them in the mouth. This makes a strong and beautiful crown, and while it is applicable *a priori* to single-rooted teeth, it may be employed on some molars.

Tube Crowns on Living Teeth.—It is seldom that tube teeth can be used for this purpose, but two cases have lately been treated by me with great success. The first of these was a lower left first bicuspid, which had a large amalgam filling, extending to the crown, on each of its approximal surfaces. The tooth was much discolored, and by its presence the looks of a good set of teeth was spoiled. The patient objected to having the nerve drilled into and killed, the more when, on removing the discolored crown, calcification of the pulp was discovered. It was decided to grind down the buccal aspect of the root nearly to the gum-margin, leaving the lingual side considerably higher. A cap and band were made to fit the root tightly and pass a short distance under the gum; a pin was soldered to this, a tube tooth adjusted to it and the bite, and the whole cemented on the living root. This device has been worn for two years, and bids fair to last twenty. The buccal side of the twenty-two-carat gold band is almost covered by the gum, and what of it is seen looks like a tiny cervical filling. The second case thus treated does not differ essentially from this one.

English Tube Teeth in Bridge-Work.—All the points of special worth given at the beginning of this paper are emphasized when tube teeth are used in bridge-work. One of the great obstacles to making a denture of this kind a success is the difficulty met with in hiding the gold when the patient laughs. By the use of English tube teeth this is easily accomplished.

For fixed bridges replacing the front teeth they are less suitable, because of the difficulty found in securing proper self-cleansing space.

A case where the cuspids are past filling, and the molars still

stand, will serve to explain the manner of constructing a large removable plate bridge with tube teeth. The crowns of the cuspids are to be cut level with the gum and the roots prepared after the usual fashion, the canals being drilled to receive a gold or platinum tube, which should be as long as possible, and sufficiently wide to accommodate a No. 13 post of hard gold. The molars are next trimmed to receive gold crowns, and a considerable notch is cut in the crown and anterior approximal surface of each. This notch (the object of which will be presently explained) should not extend on the coronal surface more than half-way back, nor on the anterior aspect more than half-way from the crown to the gum. Tubes are then placed in the roots of the cuspids and allowed to project about three-eighths of an inch. An impression of the mouth is next taken in plaster, in which the tubes will come away, and it is cast and opened as usual. The plaster teeth and roots are now trimmed, so that the cuspid caps and molar crowns when made will pass a little way beneath the gum-margin. The pattern of cap and band for the cuspid is the "Richmond," and care should be taken that each is made level with the gum on the labial side. Hard gold or platinum tubes are next soldered to them in lieu of the ordinary posts of single "Richmond" crowns. The fixing of these with cement in their proper positions, and the operation of sealing the apical ends with gold or amalgam, complete the preparation of the roots. They are then ready to receive their posts. A Melotte die of each molar is next taken, and a gold collar made to fit it. This collar is notched on its anterior surface to suit the corresponding depression on the same surface of the natural tooth; the band is put on the Melotte cast, and a piece of No. 30 pure gold is placed over the crown and burnished to fit its upper surface and the floor of the notch referred to. When this is soldered to the collar, it gives an all-gold crown without cusps. A pure gold cap is next struck up and filled in with coin gold; it is ground level on its under surface, and is in turn notched at the same part as the gold crown already made. Having adjusted it to the latter, solder together, and you have an ordinary all-gold crown, plus the recess on the crown and anterior surface.

These crowns are cemented upon their respective teeth. Posts with bent ends are now placed in the cuspid tubes and allowed to project from them about three-eighths of an inch or more. A plaster impression of the whole is now to be taken; the pins will come away in it if the direction of the cuspid tubes has been carefully considered. (Before casting the impression, slip a small piece

of metal tubing of such a size as will exactly fit the posts over each; this will prevent any alteration in their direction when they have to be withdrawn and replaced in their sockets during the making of the bridge.)

Having cast, opened, and hardened the model, proceed to make the clasps for the fixed molar crowns, as follows: First take a Melotte die of each tooth and cut a pattern, being careful to leave a portion of it high enough above the level of the tooth to permit of its being bent down and accurately fitted into the notch. The clasp is next fitted to the tooth, and the high portion is thinned down with a file and punched till it fits into the depression, as just indicated. It is now strengthened and contoured to the normal shape of the crown by the addition of pieces of hard gold soldered together with twenty-one-carat solder. This forms a strong partial cap or spur, which, bearing on the gold crown, prevents the bridge's settling too hard upon the gum. It is better to make the band and spur from one piece of metal than to solder the spur to the band when fitted, for by the former way the continuity of the metal is unbroken. The clasp must be prolonged posteriorly to grasp the distal surface of the crown, in order that any tendency on the part of the tooth to backward movement, by pressure on the spur (which will thus act as an inclined plane), may be prevented.

Now proceed with the swaging of the plate, which is made of two thicknesses of metal. Make the first one No. 24 gauge and about five-eighths of an inch wide all around. It must be struck up sharply and made to cover the cuspid caps. Next take a piece of plate, No. 26 gauge, and a trifle narrower than the first, and strike it over the latter; when fitted, solder the two together with twenty-one-carat solder, and trim to shape the thick single plate thus produced. After having seen that the plate fits, drill it through opposite each cuspid tube to receive the posts, which are introduced into the tubes and allowed to project through the drill-holes on the lingual surface. Now adjust the clasps and place a little plaster around them and the cuspid posts. When it has hardened, remove the various parts from the model, stick them in their respective places, invest, and solder with twenty-carat solder.

When bands and pins have been soldered, try the bridge in the mouth and take the bite. Select suitable tube teeth, and fit them as in ordinary plate-work.

If the cuspid tube-tooth posts be thicker than the size of pin-wire, they are to be reduced by the file to suit the porcelain teeth.

Modification of this method can be used in the construction of

any removable tube-tooth bridge. The point to be most noted is the treatment of the molars, a plan which can be adapted to suit any of the posterior teeth. It most surely prevents the "settling" of the denture and the tendency to movement on the part of the natural teeth.

Fixed Bridge-Work.—Fixed bridge-work offers but a limited scope to English tube teeth, for they can, as a rule, be used as substitutes for the masticating teeth only, for reasons which render useless the adaptation of Logan, Bonwill, and other all-porcelain crowns to like purposes. The idea must not be formed, however, that tube teeth can never be used here. In point of fact, they can, but on account of the shape of a front tooth which necessitates a short and weak lingual surface, often to be further destroyed to accommodate the bite, it has always seemed to me inadvisable to use them except in a few exceptional cases, where the bite of the lower teeth strikes abnormally far in. Here they may safely be applied. The kind of case in which a fixed bridge with English tube teeth answers admirably is one where a gap in the dental arch extends from the wisdom-tooth to the first bicuspid. The first bicuspid is banded and capped, and a pin (which acts as post both to the root and tube crown) is soldered through it. A gold crown is fitted to the wisdom-tooth, and a strong oval-shaped twenty-two-carat gold bar is made which will connect the crown and cap, and ultimately carry the teeth. This bar ought not to rest on the alveolar ridge, but must be about one-sixteenth of an inch from it, and its angle with the alveolar border ought to be such a slope downward from the lingual to the labial side as will secure a perfect self-cleansing space. The anterior end of the bar must now be soldered not only to the bicuspid cap, but also to the base of the post itself, so that the strain may be borne by both. So far, then, the bar and cuspid cap are in one piece, the molar crown remaining unattached. Place these in their relative positions in the mouth; do any adjusting that may be necessary between the molar crown and the posterior end of the bar; take them off with plaster, as just described in this operation in plate bridge, and solder. A bite must now be taken, and the teeth set up on the bar in the usual way, being fitted to it and allowed to overhang its buccal edge. When the teeth have been cemented to place with sulphur, the bridge had best be inserted temporarily in the mouth till it has proved satisfactory, when it may be fixed. A fixed bridge like this may be inserted on either side of either jaw, and modified to suit such exigencies as intermediate roots, etc.

It must not be concluded that the possibilities of tube-work have by any means been exhausted in this essay. They are at once seen to be limited by the fault in construction of the front teeth mentioned previously.

A point of great moment to the tube-worker is the alloys of gold for posts. In plate-work these are made by English dentists about eighteen carats fine. This comparatively poor grade of metal is good enough for plate-work, but in crown- and bridge-work something finer is required. For these the qualities most to be aimed at in alloying are toughness and non-liability to tarnish. Color as indicating purity is of no importance. From experience the author recommends the use of English coin gold alloyed with from one and a half to two pennyweights of platinum to the ounce for *all pins, posts, plates, and bars*. This alloy is so infusible as to admit of soldering with coin gold twenty-two carats fine.

The use of sulphur as an agent for fixing teeth on plates and bridges is strongly advocated. Excepting where it cannot (from its very nature) be employed, sulphur is far and away the best material. It will stand in mouths which are death to the very best cements, because none of the oral foods destroy it. Again, when repairs have to be done, where cement has been the fixing medium, the teeth can only be removed with great force by pliers, obviously a very unsafe proceeding. Indeed, if the pin and tube have been well roughened, the teeth cannot be, in many cases, got off without fracturing them. By the use of the agent advised all this trouble is prevented, for when the plate comes to be prepared you have only to heat it carefully and gradually till the sulphur melts, when the teeth may be easily lifted from their pins and refixed when the repair is effected.

It may be objected by some hypercritical individual that the appearance of the pins on the coronal surface of tube teeth seriously affects their value prosthetically. This, if objected to, may be overcome very easily. Having cut as much off the pin as you think fit, without impairing its function as a support to the tooth, take a white glass or porcelain rod of proper size, and insert a piece of it in the tube over the pin. This ought to be done before the teeth are finally fixed, so that the section of glass or porcelain will be firmly held by the sulphur. When finished, the most critical observer will hardly detect any break in the color of the crowns if the inlays have been well matched.

To dentist and to patient the tube tooth yields such results as cannot be got from any other substitute. What more can an

operator wish when he has presented to him for use a tooth differing essentially from the natural one in but one respect,—that it does not live? What more does the patient demand than that having his dental apparatus restored as far as utility is concerned, he is at liberty to laugh and chat to his heart's content without betraying the fact that he owes his perfect comfort not to nature, but to art? It is no exaggeration to say that in the use of the tube tooth such a happy state of things is realized. It is my opinion, formed on long experience, that were these teeth to once gain a footing in bridge-work, they would immediately find favor with all men who devote themselves to that department of our profession. The methods available to the prosthetic dentist are neither so complete nor so many as to be above improvement, both intrinsically and numerically, and in the interest of advancement I confidently recommend to you the English tube tooth.

EXPERIMENTS WITH BICHLORIDE OF MERCURY.¹

BY CARRIE M. STEWART, D.D.S., ANN ARBOR, MICH.

BECAUSE of the peculiar action of bichloride of mercury upon material of an albuminous nature, its efficacy as a germicide is believed by some scientists to be less than the standard usually assigned to it. When brought in contact with the substance to be acted upon, the albumen present is superficially coagulated, the interior of the mass escaping many times, because of a lack of penetrating power in the disinfectant. Such being the case, it has been urged that in the action of bichloride of mercury upon the germs of disease, the same effect is produced,—i.e., the external gelatinous capsule of the germ is coagulated, while the internal, vital portion is left untouched, and if by any means the compound between this covering and the disinfectant be dissolved, the micro-organism is quite as ready to manifest its characteristic phenomena as though it had never been subjected to the action of the disinfectant. Acting upon this hypothesis, investigators have endeavored by experimental research to conclusively confirm or disprove the theory, but as yet their efforts have not met with success. A method which

¹ Read before the World's Columbian Dental Congress, Chicago, August, 1893.

seems very satisfactory so far as showing the effect of certain chemical substances upon the supposed compound formed between the bichloride of mercury and the envelope of the germ, is that used by Dr. McClintock, author of a paper entitled "Corrosive Sublimate as a Germicide." This method has been used in the experiments given here, and briefly outlined is as follows:

An ordinary test-tube is plugged with cotton-wool, and through this plug is passed a glass rod containing a plug of the same material for part of its length. In the test-tube is a small amount of non-germicidal alkali, as calcium carbonate or carbonate of sodium and sodium chloride. After sterilization the apparatus is ready for use. To a definite quantity of the bouillon culture of the germ was added a definite amount of the HgCl_2 , strength 1 to 1000. After a given length of time one c.c. of the disinfected culture was transferred to the prepared test-tube and connected with a hydrogen sulphide generator until sufficient precipitation of the mercury had taken place. Gelatin or agar was then inoculated with from three to four loops of the preparation, and Petri plates made. The chemical action taking place is very manifest, the hydrochloric acid formed being neutralized by the alkali present, sodium carbonate or calcium carbonate. The sodium chloride solution assists in dissolving the compound formed between the bichloride of mercury and the gelatinous material, or the protecting envelope of the micro-organism.

The germs used in experimenting were the staphylococcus pyogenes aureus and albus, because of their frequent occurrence, and, although not spore-forming in the common acceptance of the term, they are nevertheless very resistant to destructive influences. This work was done to satisfy myself of the efficacy of bichloride of mercury as a germicide under certain conditions, and although the experiments made were comparatively few in number they were accomplished with all possible care and accuracy.

April 7, 1893, five c.c. of 1 to 1000 bichloride of mercury to five c.c. of bouillon culture of staphylococcus pyogenes aureus, three days old. Time of exposure, fifteen, thirty, sixty minutes. Agar plates. April 11, the fifteen- and thirty-minute plates well developed. April 27, sixty-minute plate still undeveloped. April 28, one c.c. of HgCl_2 to five c.c. of culture of the staphylococcus pyogenes albus, fifteen days old. Time, twenty-four hours. Three agar plates made. May 8, all three plates developed. April 28, five c.c. of HgCl_2 to five c.c. of culture of albus, fifteen days old. Time, twenty-four hours. Three agar plates made. May 8, no development on

any plate. May 3, fifteen c.c. of HgCl_2 to five c.c. of culture of the albus, five days old. Time, twenty-four hours. Three gelatin plates made. May 11, one colony on each of two plates, the other one being undeveloped. May 3, ten c.c. of HgCl_2 to five c.c. of a bouillon culture of the aureus, four days old. Time, twenty-four hours. Three gelatin plates made. May 11, no development. May 9, twenty c.c. of HgCl_2 to five c.c. of culture of the albus, seven days old. Time, seventy, eighty-five, one hundred, and one hundred and twenty minutes. Two plates for each exposure. May 18, no colonies on the plates of the first two exposures. One of the plates having the one hundred minutes' exposure exhibited one colony, while the other had none.

Of the plates having the two hours' exposure, one plate was undeveloped, while the other possessed three colonies.

May 11, five c.c. of HgCl_2 to five c.c. of the aureus culture, two days old. Time, fifteen, thirty, forty-five, and sixty minutes. Agar plates. May 22, one colony on the plate having the forty-five minutes' exposure, none on the others. May 15, two c.c. of HgCl_2 to five c.c. of a culture of the albus, seven days old. Time, fifteen, forty-five, and sixty minutes. Gelatin plates. May 22, plate of the fifty-five minutes' exposure very well developed; others not.

All these experiments were performed with sodium carbonate used as a neutralizing agent, care being taken that a sufficient quantity was used to serve the purpose. In the succeeding experiments barium carbonate was used instead.

May 16, five c.c. of HgCl_2 to five c.c. of bouillon culture of aureus, six days old. Time, fifteen, thirty, forty five, and sixty minutes. Gelatin plates. May 26, no development in any plate. May 17, two c.c. of HgCl_2 to five c.c. of a culture of the albus, seven days old. Time, twenty-four hours. Gelatin plate. May 24, one colony. May 23, five c.c. of acid solution of HgCl_2 , 1 to 1000, to five c.c. of culture of the aureus, two days old. Time, five, ten, fifteen, thirty, and sixty minutes. Gelatin plates. June 6, no development in any plate. May 31, one c.c. of acid solution of HgCl_2 to five c.c. of albus, six days old. Time, one, five, ten, fifteen, and sixty minutes. Gelatin plates. June 9, no development. June 1, three c.c. of acid solution HgCl_2 to five c.c. of culture of albus, nine days old. Time, one, five, fifteen, and thirty minutes. Gelatin plates. June 9, no development.

A little experimenting was done with a solution of HgCl_2 , 1 to 500, to test its germicidal powers.

When precipitation of the mercury by hydrogen sulphide oc-

curred, the solution was found to be valueless as a germicide; while without the action of the hydrogen sulphide its effect upon the germs was immediate.

May 19, one c.c. of HgCl_2 , 1 to 500, to five c.c. of albus culture, four days old. Time, one, five, ten, and fifteen minutes. (H_2S employed.) May 22, all profusely developed excepting the plate of the ten minutes' exposure, which had no colonies. May 19, one c.c. HgCl_2 to five c.c. of aureus culture, three days old. Gelatin plates. Time, one, five, ten, and fifteen minutes, without precipitation by H_2S . May 31, no development in any plate. May 23, five c.c. of HgCl_2 to five c.c. of culture of the albus, four days old. (Precipitation of mercury by H_2S .) Time thirty minutes. Gelatin. May 31, very well developed.

In looking over the results presented here, one will notice now and again a seeming irregularity in the development of a plate; for instance, a plate of fifteen minutes' exposure may exhibit no colonies, while one of sixty minutes, of the same series, may be well developed. This may be explained by the supposition that only the more feebly resistant germs were transferred to the gelatin, in the first case, and being destroyed by the germicide before the transference, no development could consequently take place.

In the latter case a sufficient number of the more resistant germs were brought over to show development under suitable conditions.

Again, enough of the germicide may have been taken over with the germs to have formed a sterilized area around the micro-organisms, preventing their growth in the one case, while in the other the disinfectant was sufficiently disturbed throughout the gelatin to prevent anything of the kind. Care was taken to accomplish this in every case, however.

The neutralization of the acid formed was also especially looked after.

In comparing the results obtained from the use of the ordinary solution of bichloride of mercury and that of the acid solution, it will be noticed that the latter is far more prompt and efficient in its action than the former, due probably to the excess of hydrochloric acid in the acidulated solution.

Although it is manifestly evident that bichloride of mercury is not sufficiently penetrating in its action to serve as a germicide, excepting under conditions most favorable to its complete performance of the results desired, yet the ideal germicide has not been discovered, and those that are so efficient as bichloride of mercury are hard to find. It would seem from the experiments of others,

that the more concentrated solutions of this disinfectant are still less to be relied upon in their action than the strengths more ordinarily used, from the fact that the combination between the bichloride of mercury and the capsule of the germ is more quickly effected, and, although the portion influenced is probably of a firmer consistency than that brought about by using a solution of weaker strength, still the amount of penetration is not so great and the desired results not so nearly accomplished. Because of its extremely poisonous nature, bichloride of mercury will never be extensively used alone in dentistry; yet, with a proper knowledge of its powers and those of other germicidal agents of a high degree of usefulness, a combination may be effected in the future which may prove of the utmost value to the oral surgeon.

A NEW APPARATUS FOR MAINTAINING ANÆSTHESIA WITHOUT A FACE-PIECE, AND WITH THE MOUTH OPEN.¹

BY DR. THOMAS FILLEBROWN, BOSTON, MASS.

THE necessity of repeatedly reanæsthetizing the patient has always been a great and serious hinderance to the progress and success of surgical operations within and about the mouth and throat. My own experience in operating upon the palate and lips led me to consider the possibility of maintaining the narcosis without interfering with the operation. I am pleased to announce the accomplishment of this object.

Several anæsthetists have used etherized air in inducing and continuing anæsthesia. Clover used chloroform in this way many years ago, and later applied ether the same way. Messrs. Codman & Shurtleff, of Boston, produced an apparatus for this purpose some years ago.

The working of all of the inhaling instruments depended upon the force of the inspiration of the patient to draw the air through the ether, and all except Codman & Shurtleff's provided for the patient to expire back into the instrument.

About two years ago Dr. Horace Packard used a compressible bulb to force the air through the ether, and thus made a very great

¹ Read before the World's Columbian Dental Congress, Chicago, August, 1893.

improvement over the old method ; but this still allowed the respiration to pass back into the instrument. The observations of the workings of this inhaler led me to the conception of an apparatus to accomplish the much-desired object of anæsthetizing without sponge, towel, or face-piece.

My apparatus consists of a bellows, connected by rubber tubing with the long tube of a twelve-ounce wash-bottle, with a stop-cock intervening to regulate the flow of air. From the bottle extends a half-inch rubber tube to the patient. The bottle is filled one-third full of ether. The bellows is inflated and the stop-cock opened so as to allow the air to bubble up freely through the ether, and to become saturated with ether vapor. The etherized air is then discharged through the second tube a few inches from the patient's face.

This application of ether will maintain complete anæsthesia for any length of time, and not interfere in the least with any operation in or about the mouth ; nor will the surplus vapor discharged into the air sensibly affect either the operator or the assistants.

I have maintained perfect anæsthesia for half an hour in one case to one and one-half hour in another case, without intermitting the operation at all on account of the anæsthesia. This method is not wasteful of ether, as less than one-half pound continued the narcosis the hour and a half ; but the waste I should consider of no account as compared with the great advantage gained.

I have made a still further modification of the instrument, and adapted it to the induction of initial anæsthesia, and its maintenance with face-piece for use in general surgery.

All ether inhalers now in use allow all the exhalations to be forced back into the instrument ; consequently the patient breathes over and over again the same atmosphere and becomes more or less asphyxiated, instead of truly anæsthetized. Such a plan seems to me unscientific, uncleanly, and unhealthy, in every way undesirable.

To avoid this condition, I have attached to the discharge-tube of the apparatus above described a double-valve face-piece, such as is used for the administration of nitrous oxide, and a double-end gas bag for a reservoir. By this means the patient is insured an abundance of pure anæsthetic atmosphere for each inhalation.

At the suggestion of Dr. T. M. Dillingham, I first filled the bag with pure air, and by slowly injecting the etherized air, narcosis is induced with absolute freedom from any of the disagreeable symptoms usually experienced when etherization is accomplished.

I have since found that the same object is better accomplished

by raising the tube in the bottle until it is entirely free from the ether, filling the bag, and commencing the inhalation. In this air there will be but a very little ether. Then gradually slide the tube down into the bottle, and as it approaches the ether the strength is increased; after one-fourth of a minute the patient can breathe the full strength.

If the mouth is to be operated on, when anæsthesia is complete disconnect the bag and face-piece and proceed as before described.

ON CONGENITAL DEFECTS OF THE ENAMEL.¹

BY DR. OTTO ZSIGMONDY, VIENNA, AUSTRIA.

THAT striking anomaly in enamel-development known as "erosion" or "atrophy" occurs quite frequently. In teeth so affected the coating of enamel is unequally distributed. In the lowest grades of the affection, superficial pits of greater or less depth are found at isolated points in the otherwise apparently normal enamel. These pits may be isolated, or they may occur in rows. When the pits are confluent, furrows are developed which may embrace the crown like a ring. At times several of such furrows are found arrayed in series one above the other (furrows or wavy enamel). In other cases the enamel appears as if sown with small pits (honey-combed teeth of the English). In still other cases the enamel seems to be entirely absent at certain points, and the dentine itself comes to the surface (called *érosion en échancrure* and *érosion en nappe* by French writers if the defect affects the free edge of the cutting-surface or the front teeth to a greater or less extent).

The layer of enamel lining the pits possesses a rough, uneven surface, a more or less yellowish or brownish color, and lacks the proper polish and normal transparency, while the enamel in the immediate neighborhood of the spots has all the characteristics of the perfect tissue. In those teeth in which the dentine is exposed or covered by a thin layer of enamel only, the enamel of the normal portion of the tooth stands out in the form of an annular swelling, a circumstance which has influenced certain authors to speak of the thickening of the enamel at those points. But, as can readily be seen in sections of such teeth, a true increase in the thickness of the

¹ Abstract from a paper read by Dr. Zsigmondy, World's Columbian Dental Congress, August, 1893.

layer of enamel above the normal never occurs. While the surface of the enamel is seen on cross-sections to be interrupted, dipping into the pits and furrows, the margin of the dentine seems unchanged to the naked eye. Thus portions of different thickness are found in the layer of enamel. Spots entirely devoid of enamel are found but very rarely. Spots entirely deprived of enamel, as a rule, soon succumb to caries, especially as the dentine of such teeth possesses a faulty structure conducive to the progress of the affection at those points where no enamel is present. It is characteristic of the defects in question that they are always symmetrical, so that corresponding teeth in the upper and lower jaws on both sides are similarly affected. The defects occur in the teeth whose development corresponds to the same period of time, and in the teeth they are limited to such portions as correspond in degree of development. The situation of the defects and their distance from the lateral surface of the crown accordingly vary in the different orders of the teeth. At times, if the interference with the development occurred at a very early period and no interruption in normal development took place later, it is only the first four molars, the first of the permanent teeth to harden, which show signs of abnormality. The defects are then found at the apices of the cusps only, which in consequence seem as if worn down. If the interruption of normal development occurs at a later period, when the formation of the enamel of the cusps of the first molars is further advanced, these teeth show the defect more in the direction of the root. In this case, besides the first molars, the central incisors likewise show defects in the enamel of the teeth which come next in point of time of calcification.

If the disturbance be repeated once or oftener, a corresponding series of furrows or pits will be found in the enamel of the teeth which were in process of calcification at the time of interruption of the development. If a furrow be found in the first molar near the edge, an analogous defect will appear half-way up on the crown of the central incisor. The cuspid will show the defect nearer the point of the cusp, while the first molar and the teeth which undergo calcification later will be free from defect. The lateral incisor of the upper jaw, it should be remarked, differs from the corresponding tooth of the lower jaw, whereas its calcification follows that of the central incisor of the lower jaw and precedes that of the cuspid. Calcification in the upper jaw proceeds as follows:

1. The central incisor.
2. Cuspid.

3. Lateral incisor.

This noteworthy circumstance, as yet inadequately studied, determines why we find the lateral incisor developed almost normally, while defects are apparent in the enamel of other teeth of the upper jaw. I shall not stop to consider these phenomena more at length at present; the necessary data will shortly be given in a publication by my friend G. Cunningham, of Cambridge, England.

The first molar is but rarely the seat of typical defects, the second molar still more rarely, and no instance of such defect has ever been observed in the two last molars. Certain writers maintain that the milk-teeth never exhibit typical defects. This, however, is a mistake. Temporary teeth are occasionally observed which resemble permanent cuspids and molars in defects of the enamel, and whose internal structure also shows the discontinuous lines which are characteristic of the teeth in question.

The question of the etiology of these deformities has often formed the subject of lively discussion. Seeing that the anomaly is hardly ever limited to a single tooth, as would be the case if the cause were purely local, but involves in the majority of cases the entire denture, this circumstance compels us to seek for the cause of the anomaly in general diseases of the organism whose effect as regards the other tissues of the body has vanished, while its influence has become permanent in the teeth.

Rachitis, serofulosis, syphilis, the exanthemata, convulsions, meningitis, grave attacks of suffocation, as, for example, from whooping-cough in early life, have been the alleged causes of the disturbances to the normal development of the teeth in their follicles. In view of the literature dealing with the subject, it is rather astonishing that the microscopic examinations of teeth so affected should have been almost entirely neglected, as this must form the basis for the solution of the question of the cause of the deformities. A point of capital importance is the evidence that the disturbance in development can also be observed in the dentine. The latter is not uniformly calcified in all its parts. We observe in sections of the same, at points corresponding to the fundamental strata, well-marked lines which consist of interglobular spaces arranged in rows. These lines are sections of strata in which incomplete calcification has taken place.

The few data contained in the literature bearing on the structure of teeth with defective enamel are presented by C. Wedl, in his "Pathology of the Teeth;" R. Baume, "The Defects of the Solid Substance of the Teeth," Leipzig, 1882; A. Walkhoff, "A Contri-

bution to the Theory of the Lines of Contour and to the Physiology of the Dentine," *Deutsche Monatsschrift für Zahnheilk.*, 1885, p. 576; and Charles S. Tomes, "A System of Dental Surgery," third edition, 1887.

We are indebted to Frank Abbott ("Congenital Defects in Enamel," *Dental Cosmos*, 1891, p. 605) for more extensive data on the structure of imperfectly-developed enamel. The enamel-prisms are characterized according to this author by their wavy form, and are interrupted by delicately-marked concentric striations.

Penetrating the enamel at varying heights are seen numerous pear-shaped prolongations of the dentinal canaliculi, some extending nearly to the surface; these spaces contain protoplasm, and are stained a deep-violet color by chloride of gold. At several points layers of enamel with granular pigment are seen, where the enamel has not been thoroughly calcified. In one case Abbott observed an anomalous outgrowth of enamel upon the normal enamel. In another case an originally deficient enamel was found on which was deposited a normal one.

The question whether the enamel formed coincidently with the interglobular spaces in the lamina of the dentine may not also show traces of interruption to the normal development finds no answer in the literature of the subject. Researches undertaken with this object have shown that an analogy between the lines of the dentine and the tissue of the enamel really exists.

Longitudinal section of a tooth affected with the simplest form of defect in the enamel, a furrow enveloping the crown, shows that the layer of enamel in the situation of the defect becomes gradually but progressively thinner in a direction from the apex of the crown to the root, until it reaches the deepest point of the depression, where the enamel becomes reduced to an insignificant layer varying in amount in different cases. The enamel rapidly regains its normal thickness from the deepest point of the depression in the direction of the root. The external boundary-line of the enamel gradually approaches the surface of the dentine, whence it suddenly turns sharply outward. If the section be sufficiently thin, we observe a delicate but well-marked line, broken here and there, which traverses the whole extent of the enamel as far as the surface of the dentine, and in direct continuation of the first portion of the line limiting the defect and running in the same direction. This line makes an angle of fifteen to thirty degrees with the surface of the dentine. Its direction is thus as a whole the same as that of the brownish parallel bands of Retzius, which frequently occur in considerable numbers in the adjacent enamel. In cross-sections we

see the line running parallel to the surface of the dentine and surrounding the entire crown of the tooth. The position of the line is therefore such that it is to be regarded as the section of a plane which divides the portion of enamel first from that deposited subsequently. It is probably correct to assume that it marks the limit of calcification of that portion of the enamel deposited at the time when the cause of the disturbance of development made itself felt. If a section of a normally-developing tooth be examined and the lines of demarcation between the latest deposit of enamel observed, it will be found that the layer of enamel reaches its greatest thickness at the free extremity, at the cutting-edge, or at the summit of the crown-points where calcification commences, and becomes gradually attenuated towards the roots.

The enamel-prisms corresponding to the first portion deposited are already developed to a considerable extent as regards length, while the prisms of the remaining part are not so far advanced, and in that portion still farther distant from apex of the crown calcifications were observed to have only begun in the prisms. The enamel-cells in the region of transition between the internal and external epithelium of the enamel have at this period not yet begun the formation of enamel. If the disturbance to the nutrition of the enamel occurs at this time, those cells of the enamel which have produced the prisms already calcified to a considerable extent are destroyed, hence the further development of the prisms becomes impossible. Those prisms belonging to the enamel situated nearer the crown of the tooth not being developed to the same extent, while suffering some interruption in development, nevertheless continue to progress after the disturbing influence has ceased to make itself felt, and may in many cases attain their normal size. The prisms in the region of the neck of the tooth in which calcification has not yet begun at the time of activity of the disturbance of course suffer no interruption to development.

The line of interruption above described is always found in all forms of defective enamel. Where the surface of the crown shows two or more furrows, the layer of enamel is seen on longitudinal section to be separable, with a corresponding number of strata, by lines extending from the furrows to the surface of the dentine. In those cases, also, where the defect consists of only a pit-like depression, we find the line of interruption on longitudinal section. It is exactly like those cases where the crown is embraced by a furrow on cross-section; it is noticed that the line stretches from the bottom of the pit on both sides and surrounds the entire crown.

I cannot leave the subject without making a few remarks on the nomenclature which has been used to describe the defects under consideration. Terms which are appropriate for a great many cases, such as "wavy enamel," "honeycombed teeth," "furrowed teeth," and similar expressions, are not suitable in every case. The descriptive appellations "syphilitic" or "rachitic" teeth are to be rejected, because it is doubtful whether the diseases are the real cause of the defects, and if they are a cause they can only be so in a small proportion of cases. The term "atrophy" is likewise incorrect. The expression "erosion" is no less to be rejected. Erosion signifies loss of substance by mechanical force. The term erosion is properly applied to the notch-like grooves found on the necks of teeth, and which have been produced by the use of gritty tooth-powders, etc. I shall take the liberty of offering the following: Where individual organs or parts of organs are defectively developed because of external or internal noxæ, pathological anatomists are wont to employ the term hypoplasia to express that condition. We may accordingly speak of a hypoplasia of the enamel.

May I be permitted to express the hope that this term may soon find a place in the literature of the subject?

PALATAL DISEASES AS APPLIED TO DENTISTRY: PATHOLOGY AND CASES.¹

BY VIDA A. LATHAM, D.D.S., F.R.M.S., CHICAGO, ILL.

DISEASES of the palate are not so rare as is often thought by physicians and dental surgeons, if attention be paid to that part of the mouth.

The anatomical position of the palate, by its structural continuity with the alveoli and gums in front, and its connection posteriorly with the tongue and pharynx by means of the pillars of the fauces, is liable to implication by the extension of disease from these parts; whilst, on the other hand, morbid processes originating in the palate may spread to the neighboring portions of the mouth, fauces, or pharynx.

¹ Read before the World's Columbian Dental Congress, Chicago, August, 1893.

The physician sees many cases of tonsillitis, but seldom or never considers them further than the present needs of the case require.

The condition of the palato-glossal fold should always be studied in tonsillitis, more particularly in periadinitic changes.

Inflammation of the buccal tissue is not commonly found extending onto the mucous membrane covering the anterior edge of the coronoid process (the precoronoid space of Allen). Inflammatory action about the inferior third molar is readily transmitted to it, thence involving the soft palate. Conversely, ulcerations of the soft palate may tend to involve the tissues around the inferior third molar.

Another fold of great importance is the palato-pharyngeal. This determines the site of pharyngeal irritation, for immediately to the median side a corrugation of the pharyngeal mucous membrane is usually met with in pharyngitis, more particularly in syphilitic angina. In the seat of ulcerations the study of these folds is also of primary importance.

It is necessary to remember that the palate, with the posterior pillars of the fauces, constitutes a septum between the nasal and buccal passages, which by contraction of the palato-pharyngei muscle becomes complete in the act of deglutition, and thus cuts off communication between the two cavities. Therefore, its structural and functional integrity is essential for perfect articulation, suction, and deglutition. The chief symptoms caused by lesions of this part are usually dependent upon impairment of these physiological acts.

The diseases of the palate may be grouped into :

I. Congenital malformations, as cleft palate, which it is better to treat by itself as a subdivision of palatal disease.

II. Inflammation.

III. Ulcers.

IV. Necrosis; and

V. Tumors.

[NOTE.—The detailed description of the several classes of palatal diseases which follow will be found in the paper as published in the Congress transactions.]

CASE I.—A girl, aged eight years, on examination showed a tumor of the palate, which was not apparently the cause of pain or difficulty in swallowing. On examining the growth more closely, it was found to be about the size of a large walnut, extending from the soft palate on the right side, and projecting downward towards the end of the tongue. It was unconnected with the bone, and had

a broad attachment. The microscopical slides showed small round and spindle-shaped cells in great numbers, without any definite stroma.

CASE II.—A lady, aged sixty-six, consulted a dentist with reference to the fit of her plate; on examining the mouth, a nodule was found occupying the right half of the soft palate and growing forward over the hard palate, inward and across the middle line, and downward so as to touch the tongue. It was globular, soft, and elastic, almost fluctuating; the mucous membrane over it was thin and tense, not adhesive, and there were no enlarged glands.

The growth had been developing two years, lately with more rapidity. The voice was thick and indistinct, but swallowing was easy and painless. At the operation the mucous membrane was incised and some of it stripped off; then the growth easily shelled out. It was not firmly attached, but lay loosely in the palate in a distinct capsule. Hemorrhage was free, though easily controlled by pressure. On microscopical examination I found the specimen to be a mixed round and spindle-celled sarcoma, with much embryonic connective tissue and some imperfectly-formed tabular glands.

Case III. was a tumor from the hard palate of a woman aged forty-five. This was fourteen years in duration. It was small, circumscribed, and freely movable; the mucous membrane over it being smooth and natural. The tumor was easily shelled out. In structure it had a fibrous ground substance, broken up by masses of cells into curious tracts and processes with sinuous, crescentic, and indented edges, sometimes split and frayed. The cell-masses were heterogeneous; many large squamous epithelial cells, also cell-nests. In and around the tracts of fibrous matrix were scattered shrunken, ill-shaped cells, which suggested that this matrix and the cell-nests may have been due to degeneration or perversion of masses of cells. In other parts of the section the cells were of glandular type, and laid down in tubules. The general aspect of this tumor under the microscope proved it to be altogether irregular and embryonic.

CASE IV.—This case is of much interest on account of its rare character, for so far I can only find mention of two other cases observed in this locality. The patient, a woman aged fifty-three, blonde, excellent health, has been frequently to the dentist on account of loss of teeth in the lower jaw (the reason for losing them being indefinite). A partial plate was made, but it never fitted well, and had always been such a source of annoyance by

causing irritation of the hard palate near the alveolus to the right of the median line that she removed the plate constantly.

About six months before she consulted another dentist a small soft swelling appeared upon the irritated part of the hard palate behind the alveoli of the incisors, smooth and painless. As the pain increased, she came to have the remaining tooth out on the right side, and for two months the plate could not be worn on account of the growth. The pain now having increased in severity, an operation was urged, to which she finally consented. The extent of the tumor was almost to the alveolus on the anterior and external sides, and to the middle line on the inner side; posteriorly to the suture between the maxilla and the palate-bone.

The growth was flat, sharply defined, a raised surface, and a rounded outline. It was uniformly firm, but not hard, of a purplish-black color, and occurring in patches. There were no enlarged glands.

The operation consisted in removing the whole right side of the hard palate, including the alveolus. To give room, the upper lip was freely detached from the bone.

The growth was quite firm and black on section, almost like blood. The bone was invaded with the growth, and in the central part was absorbed to the extent of a five-cent piece.

The patient made a good and rapid recovery. The face suffered no deformity. An obturator was adjusted to the palate, and the patient articulated quite clearly.

On making micro-sections, staining with logwood, methyl blue, etc., the tumor proved to be a spindle-celled sarcoma originating from the periosteum, as the examination clearly showed. The cells were large, with a considerable amount of intercellular tissue. No myeloid cells; mass unevenly pigmented. Pigment appeared in irregular blotches, brown in color, and deposits made up of granules of ruddy brown and others black in color. The cause was no doubt well localized and long-continued irritation.

It is well to note that pigment is not usually found in the human palate, but is common in many of the lower animals.

CASE V.—Adenoma of the palate. The patient, aged fifty, had known of the growth for eighteen months. It passed back on the soft palate on the left side, ulcerating in the middle, and painless. The ulcer was a distinct feature in the case, and it was referred to a number of surgeons, who agreed on its being an exceptional case. A cheesy, fetid mass, such as is often obtained from tonsillar follicles, was removed from the bottom of the ulcer. In the operation the

whole thickness of the soft palate had to be removed. Recovery was good. On micro-section it showed adenoma. The fibrous tissue was readily seen, and seemed to form an ill-marked capsule around the periphery of the tumor.

CASE VI.—Patient, a laborer, aged sixty-five, excellent health, had a growth of one to one and a half inches in circumference, covered by healthy non-adherent mucous membrane on the left side of the soft palate. He had noticed the growth for eight months. For three months it began to increase slowly, then burst through the mucous membrane in front of the palate. The last two months it grew rapidly.

The extent was by the hard palate in front, by alveolus to the left, the middle line of the soft palate to the right, tonsils and hard palate normal. No glands enlarged, nor epistaxis. Some thirty years ago patient had a similar growth on same part of soft palate. The operation was very extensive, and was performed by Dr. G. M. Brennan, to whom I am indebted for the specimen. The left common carotid was ligated, and the growth with the whole of the affected side of the soft palate removed, partly by knife and partly by thermo-cautery.

The tumor was encapsulated, about the size of a large walnut, pinkish-gray in color, and was diagnosed as alveolar sarcoma. Recovery was good.

On section large connective-tissue cells were everywhere arranged in larger and smaller groups by closely-intersecting bands of well-formed fibrous tissue. The individual cells separated by delicate fibrils with larger trabeculæ.

Primary tumors of the soft palate seem very rare. From isolated reports it would appear that all forms of connective-tissue growths have been met with in this region. It has been the seat of adenoid cancer, fleshy growths vaguely called myoma, dermoid, and papillomatous tumors. So far I have only been able to find four accounts of primary tumors of the soft palate, a cancer, a papilloma, a dermoid, and an adenoma.

CASE VII.—Myxo-sarcoma. This is another form of the sarcoma groups, and seems the variety most frequent in this region. The patient was a woman aged thirty, who had noticed the swelling five years ago. It increased gradually to within five months of the operation for its removal, then began to grow rapidly and with severe pain. It appeared as a distinctly circumscribed, smooth, slightly undulating, firm, and immovable growth, the size of a hen's egg, on the left side of the hard palate, and involving some of the anterior

portion of the soft palate. There was a distinct egg-shell crackling at circumference, but none over its central part. The mucous membrane over it was healthy; no gland-enlargement. The tumor appears to spring from the periosteum, and contains a large cyst. It was diagnosed spindle-celled sarcoma, intermixed with mucus, and this was afterwards proved by microscopical examination.

As regards the treatment, I will simply mention a few points worthy of attention. The chief danger in palatal operations is from hemorrhage,—the ingress of blood into the trachea, especially when the patient is under ether or chloroform. Cocaine renders this danger much less, but gives another form of trouble by its uncertain action. The difficulties in differential diagnosis are many, and it requires much study to know the nature of the growths and to classify them properly, on account of their irregular morbid histology.

COCAINE-INJECTIONS FOR THE PRODUCTION OF ANÆSTHESIA.¹

BY DR. ANTHONY BLEICHSTEINER, GRATZ, AUSTRIA.

UNDER this same title I presented in the year 1889 in Paris, at the "Congrès Dentaire International," the results of my experience with cocaine-injections for the purpose of painless extraction of teeth. Up to that time I had more than three thousand injections with five-per-cent. solutions of cocaine hydrochlorate. To-day I shall speak about the experience I have collected in executing more than fourteen thousand injections. I shall give you a description of,—

1. The preparation I use.
2. The character of the solution.
3. What quantities of cocaine hydrochlorate have been used and for how many injections.
4. My syringe.
5. My method of injecting.
6. My opinions concerning the intoxications following cocaine injection.

In December, 1886, I made the first trials with cocaine hydro-

¹ Read before the World's Columbian Dental Congress, Chicago, August, 1893.

chlorate (Merck). I began with twenty-per-cent. solutions. After several trials I diminished them to ten-per-cent. solutions. After 1887 I used five-per-cent., but since March, 1892, only three-per-cent. solutions.

At first I renewed the solution immediately before every injection, but when I came to execute every extraction with cocaine anæsthesia, I prepared the cocaine solution in quantities of ten grammes fluid each, and I used for the sterilization of the solutions corrosive sublimate. I took ten grammes of sublimate solution, containing one gramme of sublimate to five thousand grammes of distilled water, and dissolved in it five decigrammes as long as I used five-per-cent. solutions; now I dissolve in ten grammes of the same sublimate solution three decigrammes of cocaine hydrochlorate, by which I obtain a three-per-cent. solution of cocaine hydrochlorate. A drop of this solution contains three milligrammes of cocaine hydrochlorate.

In the manner previously mentioned, since the year 1887 I have used six hundred grammes of cocaine hydrochlorate (Merck) exclusively for injections, and according to calculation I have made fourteen thousand injections with it.

Four hundred and fifty grammes were used for five-per-cent. solutions until the end of March, 1892. From that time up to the present day one hundred and fifty grammes of three-per-cent. solution have been used, which make five thousand grammes injection-fluid of three per cent. Nine thousand and five hundred are fourteen thousand grammes of cocaine solutions (or fourteen litres), with which, by exact calculation from the year 1887 up to this date, sixteen thousand injections with cocaine have been applied.

I used the "Pravaz" syringe only for a short time for the injections. My syringe as now constructed consists of a glass cylinder encased in hard rubber; its pipe is S-shaped, and in such a way that the prolongation of the end of the pipe forms with the prolongation of the axis of the glass cylinder an acute angle of twenty to thirty-five degrees. The piston-rod of the syringe is divided into ten parts, so that one stroke discharges one decigramme of fluid or a drop. The injection-needles have different lengths, ten and twenty millimetres respectively, in order to be able to adapt them more easily to the different dimensions of the upper and lower jaws. Their sharpened ends are as short as possible, about two millimetres; therefore the length of the puncture can be very short, which is most advantageous. On the handle of the syringe there are two projections, for the forefinger and middle finger.

I will now mention my method of quickly preparing the solution of ten grammes of injection-fluid. I have vials with a wide neck, which will contain ten grammes of fluid, exactly. The vial is filled with the sublimate solution already mentioned, 1 to 5000. I now add three decigrammes of cocaine hydrochlorate, which is weighed in paper cases. By shaking the solution it is made ready for use in a few seconds. The filling of the syringe is done by dipping it without the injection-needle into the solution, and then pulling the piston-rod.

I inject only into the gums near the tooth to be extracted, and I always try to maintain the injection-needle parallel with the curve of the jaw. This is very important, for if I direct the point too much against the epithelial side the uppermost layer of the epithelium is lifted up by the slightest pressure on the piston-rod, in the form of a transparent blister. Such injections are of no value at all. But if I put the needle too much towards the jaw, then I discover that I have struck the socket. I may press as long as I like and not get anything out of the syringe. The piston-rod remains immovable, and in trying to overcome the obstacle by forced exertions either the piston-rod or the glass cylinder breaks, as I have sometimes experienced. I must therefore hold the syringe after the manner of a writing-pen, and force it between the periosteum and the socket. At this place the injection-fluid is pressed by the tension of the periosteum into the bone-tissues of the alveolar wall, and from there into the periosteum. The injection proves to be successful by the gums growing more and more pale, and the formation of a transparent circumscribed blister, which resembles very much a ranula swelling.

Four horizontal and four vertical punctures, of one drop each, generally suffice. At the mesial labial papilla of the gums I also inject two or three millimetres distant from the gums, pricking towards the distal-labial edge. If the injection has succeeded well after the first horizontal puncture, of which the growing paleness of the gums is a sure criterion, the next puncture being made in the pale place, it is not felt by the patient. In this second puncture the needle is again moved in the direction of the distal-labial edge of the gums, and after another injection has been successfully made, the whole labial surface of the gum will have grown pale, perhaps including even the two edges of the gums, mesial and distal from the tooth. In the same way I prick the lingual edge of the alveolar wall, first horizontally from the mesial-lingual edge of the gums, and then again within the reach of the pale spot resulting from the

first injection. The punctures and their effects must be continually controlled by means of the mouth-mirror, and the growing paleness of the gums must be carefully observed. If during the injection considerable of the injection-fluid should flow back along the injection-needle, then the injection must be immediately interrupted; a new puncture and new injection must be made a little distant from the first and in another direction. In order to avoid swallowing the cocaine solution, which may have flowed back, and the anæsthesia and paresis of the uvula connected with it, which usually causes a tendency to vomit, I make the patient rinse his mouth immediately after every puncture, and only then do I continue the process.

If, by the horizontal punctures, the gums grow pale all around, then I proceed to make the vertical or the parallel punctures longitudinal to the root or roots of the tooth. I generally make four of them, successively; first the labial-mesial, the labial-distal, then the lingual-mesial, and the lingual-distal puncture. Especially with the lingual-vertical punctures the assistance of the mouth-mirror is indispensable. At every puncture parallel to the length of the tooth the patient is immediately asked whether he feels the puncture, and only in the affirmative case shall the injection be effected. If in case all four vertical punctures have been still felt, the injection must be every time vertical, then it is desirable to make a few more vertical trial-punctures in the immediate space between the places where the punctures have been made, in order to be quite sure that all around the socket of the tooth to be extracted there is no sensitive place to be found for the needle. If a difficult extraction is foreseen, I inject also the septum of the gums between the adjacent teeth in the form of vertical punctures. I have now thoroughly distributed the injection-fluid all around the socket. The length of the horizontal punctures should not exceed five millimetres, while the vertical punctures shall be made as long as possible, at least above ten millimetres. Many authors advise to wait from five to ten minutes after the injection has been made before extracting the tooth. I consider this superfluous for the anæsthesia, and I proceed immediately after the injection, and to this I ascribe the circumstance that I have had to experience comparatively very few and very slight accidents.

Intoxications after cocaine injections only occur in my experience if of twenty- or ten-per-cent. solutions half or even a whole syringe-ful has been injected. In this case, if the solution be twenty per cent., either one decigramme or two decigrammes of cocaine

hydrochlorate have been injected ; but with ten-per-cent. solutions, five centigrammes or one decigramme of cocaine. These are doses which are too high under all circumstances. I only had instances of real intoxication in the beginning of my cocaine injections, and as long as I injected such doses. I then found the following symptoms: Dilated pupils, dryness of the throat and mucous membrane, tendency to vomit, a feeling of giddiness, tingling in the ears, a slow pulse, which could easily become pressed and stopped, cold perspiration on the forehead and face, on the hands or over the whole body, a high degree of anæmia of the face, etc. In particularly alarming cases, interruption of the sensory function, lethargy, decay of the bodily strength, and collapse.

I have in the beginning often mistaken for intoxication hysterical paroxysms or even apoplectic fits. My further experience has taught me to distinguish exactly the intoxications from these nervous fits. When, after proper treatment, the alarming symptoms had been overcome, I asked the patient, or those who had accompanied him to my house, whether these had made their appearance at certain intervals or occasions, and my question was always answered affirmatively.

I have found few reasons to believe in these convulsions as the consequence of the procedure, and have almost always been able to range the respective description into the series of one of the reflex symptoms already mentioned. Since I have used three-per-cent. solutions, the accidents described answered more the species of reflex actions. I have rarely injected fifty milligrammes,—that is, the whole contents of a syringe,—and it may be that at one or another time too little was injected, and so with very nervous persons these nervous spasms may have been caused by a feeling of pain from the extraction. That this with nervous persons can be the cause of the reflex symptoms has often been proved. I remember a case when three sound and firmly-fixed teeth were extracted for a very nervous elderly lady at one sitting. After an injection of two and a half syringefuls of a five-per-cent. solution, one hundred and twenty-five milligrammes of cocaine hydrochlorate, not the slightest bad consequences were to be noticed. Two days later I wished to remove a very loose root of a central incisor for this same lady, and I injected only two drops of a five-per-cent. solution,—that is to say, ten milligrammes. After extracting she fell back in the chair and her face lost its color, followed by convulsions of the muscles of the face, the arms, the legs, and of the trunk. The color of the face changed alternately from paleness to redness; clonic spasms

passed gradually over to tonic spasms, by which the muscles of the bottom of the cavity of the mouth were especially violently seized. After this kind of spasms had set in, a secretion of perspiration was to be observed. The sensory function was annulled for a short time; the pulse grew slight and could easily be compressed; the respiration became short but frequent. By a horizontal position, cold poultices applied on the forehead as long as the clonic spasms lasted, loosening of the dress, and doses of cognac, as well as making her swallow ice-cream, she was finally able, after an hour, to sit up a little. The first words she uttered were, "Why, doctor, what pain you have made me suffer. I cannot bear any physical pain at all! Only injuring my finger with a needle, I am sure to be attacked by spasmodic fits."

Taking in consideration that two days before one hundred and twenty-five milligrammes of cocaine hydrochlorate had been applied with the best result imaginable, and that ten milligrammes of cocaine hydrochlorate produced, two days afterwards, such a bad effect, the conclusion is easily justified that the symptoms of spasms were not caused by the doses of cocaine hydrochlorate; the more so as the lady herself informed me of her being subject to hysterical paroxysms. Before anything was known of nitrous oxide and cocaine I noted numerous syncope, hysterical fits, and similar nervous reflexes. Now, when using only three-per-cent. cocaine solutions, I have but rarely perceived reflex symptoms, never real intoxications.

One must be careful that with very timid and nervous patients the first puncture does not excite them, which can be avoided by brushing the gums with cocaine before the injection is applied and that the first puncture is made very gradually, though as quickly as possible; and after very little of the fluid, not even a whole drop, has been injected, the needle is pushed on a little farther, upon which a greater quantity can be injected at once. With persons of nervous disposition, the dentist must try to quiet their excitement by showing himself perfectly composed and at ease in order to gain their entire confidence and trust. Having thus succeeded, the whole procedure may be properly executed. With a three-per-cent. solution one can only experience nervous reflexes, which, however alarming they may seem, have nothing dangerous in themselves.

METHOD OF INDUCING LOCAL ANÆSTHESIA BY COCAINE.¹

BY D. CARACATSANIS, M.D., ATHENS, GREECE.

You are all acquainted with the danger of cocaine-injections for the painless extraction of teeth. Its narcotic effects are surprising, but unhappily they are frequently followed by untoward consequences; even loss of life has occasionally resulted. At the Dental Congress in Paris animated discussions arose on this subject. Since then I undertook some experiments to determine whether some procedure might not be substituted for injection, some milder method for the induction of local anæsthesia by means of cocaine.

I proceeded on the basis that if its effects could be completely localized, cocaine would answer perfectly. Such a method I have found; I have applied it practically for several years. The patients have nothing to complain of, not even the slightest indisposition. Accordingly it is with the greatest confidence in my method that I lay it before you. The operation is simple, within the power of every one; its only imperfection is that its application demands considerable time; sometimes as much as three-quarters of an hour is required for complete anæsthesia. The procedure is as follows: I begin painting the gum, next the tooth to be extracted, with a steel instrument wrapped in cotton dipped in a solution of phenic acid, 2 to 1000, which I have heated. This is followed by the application of the salt of cocaine by means of a pledget of cotton impregnated therewith. As soon as the gum shows signs of insensibility, I commence to separate it slowly from the tooth by means of a bistoury. I insert into the space thus effected pledgets of cotton impregnated with cocaine as before. As the anæsthesia advances I enlarge the opening to a depth of about one centimetre, on the buccal as well as on the lingual surface. I direct the patient to abstain from swallowing the saliva, to avoid all absorption of cocaine. I take good care not to forget the cotton pledgets placed between the gum and the tooth.

After assuring myself by strongly making pressure on the parts with a steel instrument, I have my assistant to spray the parts with a mixture composed as follows:

¹ Read before the World's Columbian Dental Congress, Chicago, August, 1893.

Chloroform, 25 grammes ;
Sulphuric ether, 40 grammes ;
Menthol, 3 grammes ;
Cocaine, 1 gramme ;
Essence of mint, 1 gramme.

I extract while the parts are being sprayed. The resulting anæsthesia is absolutely complete; the only condition in which I have failed to produce it being the existence of inflammation or periostitis.

To convince you thoroughly, I am prepared to make the experiment with my method before your honorable Congress.

SOME PRINCIPLES GOVERNING THE DEVELOPMENT OF FACIAL CONTOURS IN THE PRACTICE OF ORTHODONTIA.¹

BY DR. C. S. CASE.

THE writer stated his belief that we are at the beginning of a renaissance in orthodontia which will not be satisfied with the mere correction of malposed teeth, but will include as indispensable the correction of all facial deformities which have resulted from irregularities of the teeth and jaws, and the development of every æsthetic contour of the face that can be accomplished by a scientific application of force to the underlying bony structure. In the ordinary dental practice of correcting irregularities of the teeth, not enough attention has been given to facial effects; the principal aim having been to bring the teeth to a more perfect position and occlusion. While this has usually resulted in an improvement in the appearance of the face, even when the features were in repose, the development of facial contours from an æsthetic stand-point seems rather to have been a result than one of the principal aims of the operator.

In examining dental literature in this department, one is surprised to find so little said in regard to the movement of the roots of teeth, and the methods by which it may be accomplished; and in no place have I been able to find a single proposition for the outward or inward movement of the roots accompanied by a relatively slight change in the occluding position of the crowns; and

¹ Read before the World's Columbian Dental Congress, Chicago, August, 1893.

nothing also in regard to the movements of the roots, for the purpose of giving a more perfect contour to the face by changing the shape of the underlying bone. Dr. Farrar refers only to the movement of the entire tooth in a lateral direction. It is thus evident that the movement of the roots of teeth is a rare and somewhat modern accomplishment, and which doubtless never would have been possible under the old *régime* of regulating plates and their numerous force contrivances. Dr. Farrar thus perfectly states the only method by which a movement of the roots in the direction of the force is possible: "The secret of effecting a lateral movement of the roots of the teeth lies in relatively fixing the antagonizing ends of the crowns while the force is being applied at their necks."

The purpose of this paper is to show how this principle of force may be applied to the outward and inward, as well as to the lateral movement of the roots of the teeth; and to illustrate also the importance of this possibility, when it is observed in this operation that the bones of youth do not remain stationary to be ploughed through by the roots in a process of retrogressive metamorphosis, but that a considerable portion of the bone in which the teeth are embedded is carried with the roots in proportion as they are changed in position, thus enabling one to regulate many imperfections of the face by changing the shape and surface contour of the frame which supports and gives character to the features over all that portion which can be affected by a movement of the bones contiguous to the roots of the teeth.

The facility with which the entire intermaxillary process can be carried backward or forward under a proper application of force to the incisor teeth has been a source of surprise and pleasure to me from the time when I first attempted the operation,—less than a year ago.

I am now able to correct, with perfect certainty of success, any marked depression or protrusion of the upper lip which is mainly due to a malposition of the *roots* of the incisor teeth. Instances are frequent of comparatively perfect alignment and occlusion of the teeth, where because of the position of the roots, with a consequent abnormal depression or protrusion of the adjoining bone, considerable imperfection of features and external contour of the face is produced. Marked depression of the upper lip is often mistaken for a prognathous lower jaw, because of the lack of proper fulness in the central features of the face, which frequently affects the shape of the nose and deepens the lines on either side. For the same reason the cheek-bones will at times appear abnormally

prominent, giving to the face a broad and flattened appearance; especially if the cuspids, being retarded in their eruption for the want of room, take a more lateral and prominent position. If the lower teeth are in proper relative position and the deformity caused, as is most common, by the lower incisors occluding in front of the uppers, every change desirable may be effected by an appliance attached to the superior teeth alone. As an illustration of this, I call your attention to the models in case 2, which, with others, will be fully described later.

On the other hand, if the entire superior dental arch is narrow and contracted, with a high palatal dome, the teeth long, uncrowded, and not materially affected in position by occlusion, the face will usually be long and narrow, the nose prominent, thin, and of the Roman type. In those cases the entire dental arch and alveolus should be expanded, and the force so applied and controlled as to retain the teeth in an upright position, especially in the process of carrying the anterior teeth forward, which is of vital importance in the restoration of the features of the face. The principal force, therefore, should be exerted upon the anterior superior teeth and reciprocated by rubber bands extending from the posterior part of the upper appliance to the anterior part of the lower. These bands can be made to exert almost any desired force and be worn continuously.

A large inferior dental arch with the teeth occluding outside of the superiors may be reduced in size by the extraction of a bicuspid on either side and the anterior teeth forced back to fill the space. If the chin is abnormally prominent below the incisive fossa, teeth should not be extracted from the lower, but the principal change to correct the facial deformity should be accomplished on the upper jaw.

I have abandoned all attempts to reduce a prognathous lower jaw by external pressure upon the chin. Rubber bands, extending from the upper to the lower appliance, can be made to exert all the force the patient can stand at the glenoid fossa, and tends to force the lower jaw to a more posterior position.

Protrusion of the upper lip at that point where it merges into the nasal septum and orifices may be reduced, when due to a malposition of the roots of incisor teeth alone, causing abnormal prominence of the anterior nasal spine and incisive fossa. This position is not uncommon, even when the antagonizing ends are in perfect position, and often with the production of quite a marked facial deformity.

In like manner I am able to force the anterior inferior teeth bodily forward, with the entire embedding alveolar ridge. Instances are not rare where the point of the chin, the upper lip, and the anterior superior teeth are relatively in proper position, but with inferior teeth so posteriorly placed as to produce an abnormally deep depression or curve in the lower lip along the line of the incisive fossa. By forcing the anterior inferior teeth forward with the alveolus a more æsthetic shape will be given to the chin; a change will often produce a remarkable improvement in the general appearance of the face. The same is true, also, in forcing back the inferior incisor teeth and alveolus, when they are so anteriorly placed in relation to the point of the chin as to obliterate the graceful curve of the lower lip.

Forcing the inferior teeth and this part of the face forward is often of material aid also in the reduction of that unhappy deformity caused by a prognathous upper jaw with protruding teeth.

I believe that a large proportion of facial imperfections are due to inartistic relation of those features of the face whose form and contour are governed by the position of the teeth and the peripheral surface of the bone in which the roots are embedded. If, by force appliances attached to the crowns of the teeth of young persons, the roots and the alveolus can be forced outward or inward to any desired extent, a new field will be opened to the practitioner in orthodontia, a principal feature of which will be the correction of many deformities of the face, heretofore considered beyond the reach of orthopædic surgery. In a large proportion of those deformities which seem due to protrusion or recession of the chin, the chin is not far from its proper relative position to the forehead, the upper portion of the nose, and malar prominences, the deformity being due mainly to the relatively imperfect position of the anterior superior teeth and the adjoining bone in which they are embedded. If the crowns of these teeth are forced backward or forward to a more perfect alignment with the lower, the facial defect is only partially remedied and the real deformity far from being removed, if not increased, as it may be, by the tendency of the roots to tip in an opposite direction. But if, on the other hand, the teeth are firmly grasped by appliances so constructed that the force can be applied directly to the roots while the antagonizing ends of the crowns are fixed or controlled in their movement, it will be found that the roots as well as the immediately surrounding bone will be moved and made to take a position which will give a far more pleasing appearance to the face.

The peculiar apparatus which I use for applying force to the roots of the anterior teeth in facial contouring was first put into practical use by me December 24, 1892, and described in connection with a paper I read before the Chicago Dental Society the following February, which was published in the March number of the *Dental Review*.

In constructing an apparatus for forcing the roots and adjoining bone of the anterior teeth forward, wide German-silver banding material for the teeth should be selected, that is, five- or six-thousandths of an inch in thickness. This should be fitted to the crowns of the anterior teeth near the margins of the gum, perhaps extending beneath margins on the proximal sides. Then bars of No. 18 E. S. G. wire, slightly flattened, should be soldered to each of the bands in an upright position, and bent so as to lie along the anterior surfaces of the crowns from the apex to where the bars join the band; here they should take a direction somewhat parallel to the gum, but free from the surface to about one-eighth of an inch above its margin, at which point they should be flattened or thinned so as to be more easily bent forward and firmly clasped around a rigid bar, which is made to extend from anchorage tubes attached to the posterior teeth.

This bar, which should be very rigid, is drawn without annealing from a No. 12 extra hard German-silver wire to No. 18 E. S. G. The ends are threaded in the No. 4 hole of the Martin screw-plate, and the central portion slightly flattened in the rollers. Then it should be bent so as to rest, when in proper position, in the unclasped ends of the upright bars that have been left open to receive it. Before placing it in position the nuts should be screwed on to work at the anterior ends of the tubes.

This apparatus can be made to exert an exceedingly powerful force, but if put into practical use as it now stands the ends of the roots and adjoining bony structure would not be forced forward, notwithstanding the fact that the power is applied directly to the roots somewhat above the cervices. The crowns and the body of the roots, with a portion of the alveolus only, would be moved forward.

To complete the apparatus the fulcrum should be removed from the anterior alveolar plate, and placed so that the power can be applied between it and the ends of the roots to be moved. In other words, the crowns should be restricted or controlled in movement so that the applied force may be directed to the roots alone.

I accomplish this by a second bar, much smaller and thinner

than the first but proportionately rigid, which rests in depressions in the upright pieces along the occluding ends of the teeth. The ends of the fulcrum bar are threaded and passed through tubes that are soldered to the anchorage bands on each side below the power bar tubes, with nuts which work posteriorly to the tubes.

An apparatus for reducing a prominence of the features by exerting a posterior force upon the roots and alveolus of the anterior teeth is constructed in a similar manner to that just described, with the following exception: (1) The bands should be fitted to the crowns of the incisors near their occluding ends, for the purpose of obtaining a more rigid bearing in the changed application of force. (2) The lower ends also of the upright pieces should be made to clasp the fulcrum bar. (3) The nuts should be reversed in their relative position to the tubes. (4) In moving the roots of the cuspids where required, short sections of pipe are clasped around and soft-soldered to the bars to prevent them from slipping through the clasps at the ends of the upright pieces.

In the contouring apparatus I have outlined, the force expended at the anchorage attachments is largely neutralized by the reciprocating influence of the two forces, and this reciprocation is always equal to the power used on the fulcrum bar in preventing a movement of the occluding ends of the corners. The balance of the power, which may be considerable in the general movement of the parts, must be sustained by the anchorage teeth if not further neutralized by other auxiliaries.

When the central features of the face are depressed with anterior superior teeth occluding posteriorly to the lower, accompanied by the usual real or apparent prognathous lower jaw, great reciprocating force may be beneficially obtained from the rubber bands before mentioned. These are cut from a three-eighths inch rubber regulating tube of good hest, and passed over the projecting ends of the anchorage tubes on the upper appliance to buttons on a lower appliance opposite the first bicuspids. The latter appliance may be so constructed that the force will be distributed to all the inferior teeth and indirectly to the jaw, forcing it to a more posterior position. The elastic force of the rubber bands can be made to do effective work to the full extent of their power, that would otherwise be expended upon a static anchorage neutralizing force on both the upper and lower jaws. They are useful also as an auxiliary in the reduction of a prognathous upper jaw by reversing their attachments. In these cases I also make use of the occipital force, largely for the advantage I obtain in forcing the anterior teeth farther into

their sockets. Cases of prognathous upper jaw with protruding teeth are rare in which there is not abnormal prominence, at the base of the nose, of the bones that sustain the septum and wings of the nose. When the crowns alone of the anterior teeth are forced back this prominence becomes more pronounced, even though the position and appearance of the teeth and the face are improved.

In these cases, therefore, I consider it quite as important to move the roots as well as the crowns of the anterior teeth, when by so doing I find I am able to remove the entire deformity and greatly improve the general form of the face.

[Dr. Case then presented a number of models of cases showing the action of the contouring apparatus when put into practical use.]

PRUDENCE AND GUTTA-PERCHA IN CROWN- AND BRIDGE-WORK.¹

BY GEORGE V. I. BROWN, DULUTH, MINN.

MY desire is to avoid, so far as possible, the detail of mechanical construction, and deal with the broad underlying principles that govern the attachment of a foreign substance to a root in the living mouth, as a substitute for nature's perfect crown-work, and the yoking of one tooth to another to support substitutes, and calling upon them to perform duties belonging to the full number.

Experience has certainly given this class of work an unquestioned right to be considered among the useful and therefore reputable operations in the oral cavity; and the query naturally arises, "What has been the effect of this introduction upon the general practice of dentistry?" and a glance at the record seems to prove that the result has been a marked one both for good and for ill.

The benefits have been the preservation and restoration to a state of usefulness of many roots and broken-down crowns of teeth that would otherwise have been lost, thus putting off the evil day when artificial dentures would be necessary.

Again, the result of this effort to utilize such roots has more than anything else influenced the wonderful advance in the therapeutic

¹ Read before the World's Columbian Dental Congress, Chicago, August, 1893.

methods by which they are restored to healthful usefulness, and diseased conditions removed.

An advance has been made, in that while the average dentist was almost totally ignorant of metal plate-work, to-day every student is required to have sufficient skill in this direction to be able at least to make an artistic-looking gold crown. On the other hand, instead of acquiring greater perfection in filling, the temptation has many times been too great to cover teeth with large cavities but good remaining structures in this manner, until the wholesale destruction of natural crowns that might properly have been filled is something to look upon, and unless the tendency be checked yet more terrible to contemplate in its future aspect.

Many times, too, there has been a total loss of good roots and even whole teeth through injudicious attachment for the purpose of sustaining a strain they were unable to bear.

It is a well-known principle that a thing can be no stronger than its weakest part. This in crown-work would mean that the following points particularly need protection, which the perfect crown must provide :

First. Attachment to secure without fear of dislodgement.

Second. A natural appearance if for the anterior teeth.

Third. Provision against the action of destructive agents at or near the gingival line.

Fourth. Secured against danger of splitting by a band, or its equivalent, by forming the joining surfaces of root and crown in such manner as to equalize the strain.

Fifth. The imitation of the natural form of the crown upon approximal and occluding surfaces.

Bridge work embodies dangers, increased proportionately to the greater strain it is necessarily called upon to bear and its difficulty of adjustment, with the added risks of the perhaps doubtful capability of a few roots to perform the natural service of several, besides having to support the sometimes not inconsiderable weight of the attachment, and must be so formed that the collection of particles of food and other readily decomposed matter between the bridge and the membrane covering the ridge under it may be avoided by making the surface self-cleansing so far as possible.

Having enumerated the requirements, an examination of the various methods seems to be in order, and I begin with the broad-sounding but quite true statement that crowns inserted with any of the oxychloride or oxyphosphate cements, without band or other protection at the joining with the root, no matter how secure the

pin may be, must be considered as of a temporary nature, for no matter how perfectly the surfaces may be adjusted, disintegration will surely follow, and not only cause loosening of the crown but allow more or less destructive action upon the root itself.

The use of amalgam as a setting is, of course, a great improvement upon cement in crowns of this class, but even amalgam is not always proof against bacterial influences at that critical point, the gingival line, as shown by the frequent failure of fillings. The force of the jaws applied in general use, or an accidental blow, not infrequently causes that most serious of possible troubles, the splitting of the root perhaps beyond repair, unless these crowns are protected with a band, a thing not ordinarily practicable in using amalgam, or by making the end of the root convex, and having a concavity in the crown to fit over it, by grinding slanting surfaces externally and internally from a point in the centre, giving a "V" form, or taking some other precaution to equalize the strain so far as possible, and distribute its effects all around the root instead of being applied to one side without the assistance of the support of the other.

The Logan, Bonwill, Howe, and other *all-porcelain* crowns most commonly used with cement and amalgam, as described, have certainly the advantage to some extent in natural appearance, which must be conceded for the six anterior teeth over other methods which require the use of a plate-tooth with backing.

Noting the value of a band for the security of the crown, a special consideration of its application is next demanded.

The perfectly-fitting band, as described by the facile pens of writers and the positive statements of discussers of the subject, to the experienced mind, must be much modified to conform to the hard facts of daily practice. Granted that upon a single reasonably sound root, ground down and stripped of its enamel, with the gum in a normal healthy condition, a band can be so fitted that when set with cement there will be but little if any fear of disintegrating action of the secretions; grant still further that this would also hold good where two such roots were situated in the mouth in suitable position, so nearly straight in the jaw as to admit of the completed piece being passed over each at the same time and in the same direction, then ask ourselves how many of all the broken-down and once diseased roots that we desire to save would correspond to that description, and of all the bridge cases we have and are caring for, in how many are the roots so conveniently situated; add to these the consideration that in all other cases more or less opportunity

must be offered for the secretions to act upon the cement, knowing as we do that it offers but very uncertain resistance to such action, and we realize at once this weak point in present methods, and the need of some improvement in this direction.

The teachings of Dr. Flagg and his followers, while, perhaps, going further than could be generally recommended, have at least been instrumental in establishing the value of gutta-percha in its capability to withstand the action of the acids of the mouth, and as a preservative against caries even where every other filling-material would fail; its only disadvantage being that it wears away too readily in exposed positions; but while its good properties are of the first importance in crown-work, the softness does no harm, because it is protected from wear and will not disintegrate. The advantage may be summed up before proceeding to more detailed description under the following heads:

First. It is impervious to acid secretions or bacterial influences.

Second. Not irritating to surrounding tissues.

Third. Easily removed when necessary.

As against these three there is simply one consideration, viz., the difficulty of adjustment. The value of these properties can best be understood by contrasting with other methods generally advocated.

The system once so positively advanced, but in the light of civilized progress apparently losing advocates, which required the snapping off of natural tooth-crowns, the destruction of pulps by driving a wooden point into the living contents of freshly uncovered canals, and the withdrawal of the pulp with the wood, is to my mind unprofessional to a degree bordering closely upon the barbaric.

The most elaborate piece of amalgam-work that I have ever seen, having been under my observation for some months past, has convinced me that first of all such manipulation in average hands would be out of the question; and while I doff my hat in deference to the wonderful ingenuity and great skill which enabled the well-known operator to build solid masses of amalgam from one loose tooth to another, and even across the vacant spaces where teeth had been lost in both jaws, anchoring it firmly, and building up most shapely dummy crowns of this material, it did seem to be a most unnecessary expenditure of talent in view of simpler and much safer methods.

Dr. E. Parmly Brown has undoubtedly done much with his system of porcelain bridges secured with gold fillings, malleted

about a bar extending into the tooth, and here again is an example of what individual skill can do; but from the stand-point of the less skilful average practitioner, there are some points which seem to require criticism in comparison with other needs.

For firmly fixing the position of teeth loosened by pyorrhœa, bands carefully fitted, soldered together, and cemented in place are a step in advance, but they also allow the pressure upon the crowns to work to their disadvantage, and the cement gives out so soon that they can hardly be considered of any paramount value.

Filling with gold about a gold wire embedded in the cutting-edges of lower incisors is not only an exceedingly laborious, but it is also a difficult and uncertain operation to impact the gold securely when the teeth are not held so firmly that movement is next to impossible; and it is almost an impossibility to do it, because not only are such teeth capable of forward and backward, lateral and circular movement, but upward and downward as well, and thus making a very poor resistance to the necessary force in condensing the gold, without which the operation is valueless.

The anchoring of amalgam upon each side and building across from one to the other, even in most skilful hands, seems to be insufficient except in very favorable cases, besides being, as already stated, most unsightly. But by dressing the sides of the tooth as straight as possible up and down, grinding enough of the cutting-edge to allow of a covering of gold without interfering with the occlusion, and bevelling to let the enamel-edge hide so far as possible the gold covering, a metal die made from a cast and perfect impression, the crown of gold plate struck up and made to accurately fit the cast, and the front part afterwards cut out, these all put in place in the mouth, an impression taken and all soldered together, then set with gutta-percha, the result is that each tooth not only is firmly held in position with its neighbor, but the edges are so covered that no upward and downward movement can occur, and we know that gutta-percha, while it may wear off a little at the exposed edges, will not disintegrate under the gold covering, therefore that operation may be regarded as a permanent one, besides being less unsightly than most of the other methods, which do not require cutting off the tooth.

This method applied to the abutments for bridges where any of the anterior teeth remain in a condition sufficiently sound to warrant preservation of the natural crown, avoids the destruction of nature's handiwork as shown in a living, nourishing, healthful pulp and natural tooth-structure, gives an attachment that is absolutely

secure and proof against every force that may be applied without fear of checking porcelain fronts, can be carried up beyond the gingival margin, left a little short of it, or taken to the enamel line just as the surrounding conditions seem best to warrant, because of the trustworthiness of gutta-percha under fire of the secretions.

To one accustomed to use cement for this purpose the difficulty of applying gutta-percha as a substitute seems almost insurmountable; but a moment's recollection of the trials attendant upon the setting of his first crowns will recall the fact that cement too had its difficulties for the beginner.

For gold crowns, where teeth are covered entirely, I prefer the red gutta-percha we get in form of sheets. It has a degree of toughness that is valuable, but for anterior crowns with open faces the red line at the edge of the openings is undesirable, and I therefore use some white preparation that softens at a low temperature, as this property greatly facilitates its handling in the mouth. There being no danger to apprehend from wear, hardness is not so desirable as for filling.

It is my custom to heat both crowns and setting-material upon a tray to protect from the open flame, spread with warm instruments a thin coating over the inner surface of the crown, which should be first roughened on the inside by scratching with an instrument, aiming to have as nearly as possible the exact amount necessary, but depending upon a vent to get rid of a small amount of surplus; then after drying the surface of the teeth with alcohol and warm-air blast, wipe with some suitable germicide, saturate a pledget of cotton in eucalyptus, coat the surface with it to prevent the too rapid drying of the chloro-percha, of which a thick solution is then applied around the neck, so that when the crowns already heated as hot as they can be handled in the fingers and prepared as described are driven home, the eucalyptus, chloro-percha, and gutta-percha in the crowns will form a thick creamy mass that will penetrate and perfectly fill every space about the necks, and, even if surplus be not removed afterwards, will not cause irritation as might a particle of cement in the same position.

Sometimes too much gutta-percha will prevent the crown going quite into the proper position, just as sometimes happens with cement; but the remedy is much simpler, because easily removed while still warm; or if, for accidental or other causes, removal be desired afterwards, hot water or hot air applied will in a short time heat the metal sufficiently to soften the material and facilitate the separation without the necessity of damaging the crown, and any

one who has tried to pull them off without first warming will be quite satisfied that any properly-adjusted crown can be securely held in this manner.

SOME FACTS SHOWING THE RELATIONSHIP OF THE DENTAL INTERARTICULATION, WITH MORE OR LESS OBSCURE PAINS ABOUT THE MOUTH AND JAWS.¹

BY L. VAN ORDEN, M.D., SAN FRANCISCO, CAL.

IN April, 1889, Mr. W. G. L. presented himself with acute pericementitis of the left superior cuspid, which possessed dense structure, with a fair-sized gold filling upon its distal aspect. At the time a pulp-lesion was not presumed to exist; but as it was observed that some irregularity was present, and that the occlusion was not normal, an engine-stone was used to relieve the tooth of undue work and the patient of an amount of pain that almost seemed to demand recourse to extraction. No abscess formed, and the recovery was so rapid as to fix the case in the writer's mind without the aid of any memorandum. An examination of the case after four years shows no recurrence of any trouble, but discoloration seems to point to death of the pulp.

On Christmas-day, 1891, Mr. C. B., aged about forty-five years, of bilio-nervous temperament, called upon the writer at his residence, with an acute abscess pointing upon the lingual aspect of the socket of the right inferior third molar, well below the gingival margin. Temporary relief was afforded by evacuation, and at several subsequent sittings, type-writer's carbon paper was made use of and the occlusion of the tooth with the superior second and third molars rendered comfortable. By reference to these models, which are those used in illustration of Dr. Dean's paper, published in 1892 in the *Dental Cosmos*, as a reply to the paper by Dr. Davenport, of Paris, on the dental interarticulation, it will be observed that the right lower first molar and second bicuspid had suffered extraction some years previously. While Dr. Dean pointed out several ill effects that had seemed to follow these extractions, including no-

¹ Read before the World's Columbian Dental Congress, Chicago, August, 1893.

ticeable cupping of the right cuspids and bicuspid and pyorrhœa alveolaris of the right superior central and lateral incisors involving a loss of their proximal process to the depth of about one-half inch, it seemed probable that the forward migration of the right inferior second and third molars had given rise to slight but repeated shocks or insults to the latter tooth. The *cup-and-saucer* form of the interarticulation of the right third molars may here be adverted to. The distal edge of the saucer has seemed, in a number of cases, to be especially concerned in producing the slight shocks which resulted in such severe inflammation. Though this abscess was the third one that had formed, no other trouble was complained of by the patient until some eighteen months later, when an abscess having formed on the buccal aspect, the tooth was extracted.

A Mrs. B. had been suffering with a slight dull and quiet continuous pain in the region of the left superior third molar. Several dentists had been consulted, and ascribed such causes as a "slight cavity, too small to fill," and "a dimple" (exostosis?). The tooth was slightly sensitive to percussion; the first lower molar was missing, and the *cup-and-saucer* condition of interarticulation was noticeable, and profiting by the previous case, the distal edge of the saucer was reduced and immediate relief was acknowledged.

A Mrs. D., aged about twenty-three years, had an exposure of the pulp of the left inferior first molar, which was disclosed upon the removal of a large and defective amalgam filling, pain being present. The pulp was devitalized and the canals medicated and filled. The patient returned complaining of discomfort. The left superior first molar had been extracted. As the left superior and inferior molars were sensitive to percussion, their interocclusion was eased and the trouble ceased. It seemed at the time that part of the discomfort was caused by lateral pressure of the left inferior second molar upon the inferior first molar, thus keeping up an irritability of the pericementum of the latter tooth.

Mr. F. V., aged twenty-four years, had for many months suffered discomfort in mastication with the left superior second molar; an itching sensation in the tooth was also complained of. The patient acknowledged a great sense of relief when the force and direction of the impact had been modified, and has had no return of the symptoms in more than a year.

The foregoing cases have been significantly associated with the loss of one or more teeth through extraction. The case of Mr. L. C., aged thirty-five years, is associated with a comparatively normal denture. After the large bucco-morsal cavity of the left inferior

second molar had been successfully filled, tenderness was noticed in the first molars of the same side. The discomfort seemed to be due to the prominence of the cusps of these teeth, and comfort was restored by the use of test-paper and the corundum-stone.

Reference having been made to the "cup-and-saucer" form of inter-occlusion of the third molars, the writer has ventured to refer the same to a pivoting action of the masticatory apparatus, sometimes more pronounced on one side than on both. A Scotch gentleman, about thirty years of age, called in 1881. The only defects to be remedied were two small cavities on the buccal and morsal aspects of the left inferior third molar. Gold fillings were inserted, which, in time, were dislodged; and both amalgam and cement fillings were resorted to, from time to time, without success, until now we have the deep, smooth saucer-shaped surface in the lower tooth with its converse in the upper tooth. (The concavity will sometimes be found to exist in the superior tooth, and the convexity in the lower one.) That there is and perhaps always has been disproportionate muscular action, in this case, on one side, is somewhat supported by the fact that, in 1888, the lingual portion of the crown (non-carious) of the left inferior second molar was broken off by biting upon a small piece of bone in the food. The pulp, being exposed by the accident, was devitalized by arsenic, the canals were filled with a medicated paste, and the crown restored with amalgam. In July, 1893,—five years later,—this tooth was found to be again fractured longitudinally through its buccal half, and was extracted as being beyond further aid.

The main benefit that the writer has derived from the observation of these and other cases has been the conviction that the extraction of one or more teeth, especially of the inferior first molars, is liable, sooner or later, to lead to discomfort in some of the remaining teeth, and that such discomfort may, with patience, be located and relieved by the use of an engine-stone.

THE TREATMENT OF INFECTED ROOT-CANALS WITH
KALIUM AND NATRIUM.¹

BY DR. EMIL SCHREIER, VIENNA, AUSTRIA.

I HAVE taken the liberty to request a place on the programme of this distinguished body for the reason that I entertain the hope that the subject of my paper is of such importance for daily practice that it cannot fail to arouse the interest of a large proportion of those present. It is my purpose to lay before you a procedure for the antiseptic treatment of infected root-canals, which from its great simplicity and ease of application, as well as on account of the many excellent results which have been obtained therewith, deserves consideration from this distinguished assembly. I refer to the method of treatment introduced by me with kalium-natrium (potassium and sodium).

For the sake of brevity I shall limit myself to developing the principles which underlie the method. Should I succeed in arousing the interest of the audience, discussion will undoubtedly take place, when I shall have the opportunity to express myself more at length upon this subject, which I have thoroughly elaborated. When a tooth with gangrenous or necrotic pulp comes under treatment, the dentist is confronted with the task of removing as far as possible a gelatinous, slightly consistent mass from a capillary tube, and this having been accomplished, to introduce into the same canal an antiseptic for purposes of disinfection. You are all aware how much time, patience, and skill are necessary for this operation. The average dentist has enough trouble in many cases in simply probing the canal with a delicate needle, not to speak of cleansing, and much less filling the same; he is, accordingly, compelled to leave out of consideration any thought of saving the tooth. Such cleansing, however, is unnecessary, if it be possible to convert the septic contents of the canal into an aseptic condition, and the operation is much simplified if it be possible to effect the transformation by the simple introduction of a nerve-needle.

My method seeks to fill the first indication by a chemical decomposition of the putrescent contents, in which the root-canal serves as a test-tube; the second indication is fulfilled in the development of a substance which is readily taken up by a nerve-needle, and suf-

¹ Read before the World's Columbian Dental Congress, Chicago, August, 1893.

ficiently adhesive for introduction into the canal. This substance which you here see consists of kalium and natrium in a metallic state. I pierce its paraffin stopper with a nerve-needle chosen at random. You observe a delicate deposit resembling quicksilver on the needle. I now dip the needle in a glass of water; the needle describes a fiery tract therein. In the root-canal in question there exists a putrescent mass. This consists of water and the decomposition product of albumen, the latter consisting especially of fats and fatty acids.

These substances have been formed by the influence of bacteria, and serve as a culture-medium for the various species contained therein. If I now introduce my preparation into the canal with the needle, decomposition of the watery contents will occur, with development of a considerable amount of heat. Potassium and sodium hydroxides are formed, which, in combination with the fat of the pulp, form soap. The characteristic gangrenous odor is accordingly changed into a well-marked soapy smell. A portion of the alkalis possess the well-known property of rendering albuminous substances soluble. Thus any remains of tissue adherent to the walls of the canal are dissolved, the latter become macerated, and access to the dentine canaliculi is possible sooner than can be effected by any other method thus far employed. Destruction of the organic contents of these canals is now possible. You will readily understand that in consequence of such destruction the disagreeable discoloration which too frequently occurs will be absent, and that the lime-salts of the tooth proper are in no wise injuriously affected by the treatment.

The introduction of the potassium and sodium has the additional effect of destroying the bacteria, partly by the heat produced, and partly by the new products formed. The contents of the canal have been transformed into a sterile and probably antiseptic mass, and thus the development of new colonies of bacteria is prevented. Everything has thus been accomplished which precedes permanent filling of the tooth.

A series of questions will no doubt spontaneously arise in your minds which will take form somewhat as follows: Have any particles of the septic contents of the canal been forced through the apical foramen before sterilization has been complete, and so caused infection of the alveoli? Has the destruction of the bacteria been shown to have been certainly accomplished? And finally, does the preparation adhere to the nerve-needle sufficiently to be easily transformed to the canal?

It will not be difficult to give a satisfactory answer to all these questions. I hope to have the opportunity of demonstrating my method on the living subject, and you will see how the transmitted mass travels in the direction of least resistance—that is, into the orifice of the canal next the pulp chamber—and wells up alongside of the needle. But the results of practice better than mere theoretical deductions demonstrate the groundlessness of such apprehensions. Reports from various sources are at hand as to the results of the preparation in practice. They are all eminently satisfactory. This would be impossible if the infection of the alveoli had occurred in any but the most insignificant proportion of cases. That the bacteria are actually destroyed I have proved by cultivation experiments, with the full description of which I shall not weary you. Hardly any one would seriously doubt the possibility of the method practised by me in effecting the destruction of organic life. I shall best succeed in convincing you that the preparation has sufficient consistency to adhere to the needle, by passing it around in actual contact with the needle. I shall probably have an opportunity of expressing myself upon various questions which may be raised in the discussion. It is scarcely necessary for me to state that my plan of treatment should only be practised with the coffer-dam. In an assembly like this, this fact will appear self-evident. Of course care must be exercised in manipulating with the preparation. With proper care the preparation is free from all danger.

A further question may be raised, whether the methods heretofore employed do not give satisfactory results—that the introduction of a new one is superfluous. I believe that I am entitled to say that the plan of treatment proposed by me is founded upon correct principles, and meets the obvious indications as regards ease and rapidity of application and certainty of result. It is, to say the least, the equal of any method. Every practitioner is in a position by the aid of my preparation to save with rapidity, ease, and well-nigh with certainty, teeth that have been seriously affected, and that without special preliminary preparation and without troublesome appliances. Thus the benefit of treatment of the root becomes possible for the masses. Inasmuch as the greater portion of mankind is forced to lose the teeth for lack of the means of calling in the aid of the dentist at the proper time, I assert that my method marks an important epoch in the progress of root-treatment, and I take the liberty of requesting you to submit the method proposed by me to your distinguished consideration.

SOME CHANGES THAT TAKE PLACE IN AND AROUND
THE PULP-CANAL.¹

BY DR. D. E. CAUSH, BRIGHTON, ENGLAND.

DURING the microscopic examinations of exostosed human teeth, my attention was continuously drawn to certain alterations in the shape and structure of the pulp-canals; it was an unusual thing to find in an exostosed tooth a perfect pulp-canal, and this led me to the examination of a large number of these teeth. The subject has been under observation about five years, and the deductions drawn are from the examination of between two and three thousand teeth. I was led to the furtherance of this study on observing certain irregularities of outline in the pulp-canals of the teeth. In some cases I noticed here and there slight excavations at certain points of the canal, and from that stage was enabled to obtain microscopic slides illustrating the various stages of these changes, until the whole of the original outline of the pulp-canals had disappeared, leaving in its place a very irregular canal. It was also much enlarged, and it was observed that frequently in different directions the contour of the canal varied much, as the excavations may extend over a very small portion or they may continue in any given direction until a second canal is formed, frequently passing at right or acute angles to the original canal, continuing until it has passed through the dentine into the cemental tissue. These canals may be either simple or branched, or, instead of passing thus at angles to the pulp-canal, the two or three of an inferior or superior molar may be united together into one large irregular canal.

In all cases where this change has taken place the margins of the canals show a more or less irregular edge, produced by the semilunar excavations of the dentine.

The definite termination of the dentine, as seen in the pulp-canal of an ordinary tooth, has given place to the indefinite, and irregular margins are produced.

These semilunar excavations vary much in size, as well as in number, varying from a single slight dip or depression as found in the earlier stage to the numerous excavations producing the complex and irregular outline as seen in the advanced stage.

¹ Read before the World's Columbian Dental Congress, Chicago, August, 1893.

If, as is often the case, these teeth remain in position after these excavations have been produced, a second change more marked even than that of the excavation oftentimes follows, for in these depressions it is not at all unusual to have a deposition of new bony tissue, entirely different in microscopic structure from the dentine which surrounds it. In this new tissue we have no tubuli radiating to a given centre, as in the ordinary dentine, but instead we have a number of lacunæ and canaliculi, in character somewhat like those found in true cemental tissue. This tissue does not appear to be true bone, as it is very unusual to find any true Haversian system, even where there is comparatively a large amount of the new tissue deposited. The lacunæ as seen in this tissue are irregularly placed, as in the thickened cemental tissue, and vary much in number and position. They may be very closely packed with short canaliculi, or they may be scattered throughout the substance of the tissue, and have canaliculi of some length joining two or more of the lacunæ together.

As to how these changes are brought about is a subject of great interest, and we do well to carefully consider it.

The irregular margin and semilunar character of the edges give us a clue, and show at once that there must have been absorption going on in a greater or lesser degree, according to the amount of change that has taken place. This absorption may have commenced at different points of foci along the margin, and progressed till the whole of the margin is acted upon, or it may commence all along the edge of the canal at the same time.

It is evident (microscopically) that such an edge could not be produced by the addition of new tissue alone, as in cases where secondary dentine is deposited either as dentine of repair (in those cases where caries has almost penetrated to the pulp-canal, or as a result of repair following accidental penetration of the pulp-canal during the operation of preparing a cavity for filling), or as a result of pulp-calcification, for in either of the enumerated cases the microscopic structure of the tissue is quite different; in all these cases the new tissue is always added *directly* to the older tissue without any excavations or absorptions of the original margin, and the secondary dentine is deposited directly from the odontoblastic layer of the pulp. It would appear then that these excavations and this new tissue, cemental in character, could not be produced directly from the odontoblastic layer of the pulp in health, for we have seen under such circumstances, should there be any deposit, it would take the form of secondary dentine or pulp-calcification.

To understand the changes that have taken place in the teeth we must consider three things:

1. The change that takes place in the odontoblastic layer.
2. How the excavations along the margin of the original tissues are produced; and
3. The manner in which the new tissue is deposited.

It may help us to understand these changes if we devote a short time to the careful examination of the exterior surface of an exostosed tooth. We will take for our examination a tooth where there has been acute inflammation of the membrane, and then a time of rest. On examining such teeth, the first thing to which our attention will be drawn is the thickened condition of the membrane, which may appear two or three times as thick as in health, and at certain places under the membrane we may frequently find excavations going on and giant-cells in position; again, in another place in this root we may discover some older excavations, and a layer of new tissue filling up the excavations and increasing the size of the exostosed tooth by the additional tissue formed; in fact, the three stages of the development of cemental tissue in exostosis.

Keeping these changes before us we will endeavor to follow the history of the changes that take place in the pulp-canal.

The first we have to consider is that which occurs in the layer of odontoblasts or lining cells of the pulp-canal. These cells are the points of attachment, too, and the source of nourishment from the pulp to the dentine, the connecting link between the hard calcified dentine and the soft vascular tissue and nerve-matter that forms the pulp; it is from this layer that the secondary dentine is formed, but under certain circumstances the character of the cells forming this layer changes, both in shape and size. Thus, if by such cause as congestion or slight inflammation of the pulp, a greater amount of blood is carried to the blood-vessels in the pulp, these cells appear to lose their original shape, and (instead of being elongated with processes penetrating into or passing between the tubuli) swell up, the nuclei becoming active, and new cells are rapidly formed by cell-division. As these new cells continue to form, a layer like the alveolar dental membrane in appearance is produced, and this newly-formed layer presses upon the dentine. The cells in juxtaposition with the dentine begin to absorb the latter, and thus obtain more room for further development. This goes on as long as there is an abnormal blood-supply to the pulp, and thus, owing to either a long or short time of pressure upon the dentine, caused by the excess of formative material brought to the cells by the in-

creased blood-supply, many or few excavations may be produced, as in the case of chronic inflammation of the pulp we get many excavations, and oftentimes these penetrate more deeply into the original tissue. Or should there be any imperfectly-calcified tissue surrounding the pulp-canal, at that point the giant-cells will penetrate more easily and the excavations will increase in that direction, and in some cases produce canals that pass out of the pulp-canal at various angles. These excavations may grow continuously, or there may be times of quiescence as well as times of activity, while these terms of activity or rest may correspond with similar changes on the external surface of the tooth and produce layers of cemental tissue. Should the tooth be extracted about this period, nothing but the excavations or the thickened membrane will appear in the pulp-canal.

These changes, as we have seen, are produced by those that have taken place in the odontoblastic layer of the pulp-canal. If the tooth is not extracted the whole of the pulp becomes more or less congested and altered in character; the odontoblastic layer being destroyed, there is little or no intercommunication with the dentine by the tubuli, and at this stage one of two things may occur:

1. The blood-supply becomes normal, the congestion temporarily passes away, and for a short time the tooth is tender to the touch as if there had been periostitis, and from this stage it gradually becomes comfortable, and remains so until the inflammation again commences, or,—

2. The giant-cells change their character and become formative cells, producing as a result of calcification a fresh tissue in the canal containing a number of lacunæ with their canaliculi. In this tissue a new tissue is formed in the enlarged pulp, in character and in microscopic structure resembling cementum, developed also from a membrane similar in character to the alveolar-dental membrane; and on considering the close relationship during development of the two tissues (dentine and cementum), it does not appear to be at all difficult to follow the various stages that take place in the production of this new tissue. These changes are not confined to the human subject. I have found the various stages in the incisors of the horse, though the molars are all free from any of the various changes. I have also found the incisors of the horse exostosed, as well as the enlargement of the pulp-canal and the new tissue deposited in the excavations.

BORACINE (TETRABORATE OF SODA).¹

BY DR. DENIS, PARIS, FRANCE.

IN one of the last numbers of *E' Odontologie* there appeared a most interesting article, treating of the antiseptic properties of boroborax.

For some time past I have used an identical process and a similar substance called boracine. It is a salt, perfectly purified, resulting from the combination of equal parts of borax and boric acid. This tetraborate of soda is neither caustic, toxic, nor irritating, properties that often belong to antiseptics. Moreover, it has the advantage of being tasteless and odorless, and of dissolving in the proportion of sixteen per cent. I have tested the value of these products, and these are the observations which I have made: First, I have employed it for the disinfection of the dentinal tubuli, and I must say that the results were very satisfactory. However, the results I have obtained have not permitted me to substitute it for the different antiseptics already known. I have also applied it in the treatment of the mucous membrane, in which case it has given me astonishing results.

Among the number of cases, which are too long to enumerate, there are two which are particularly interesting. The first one was upon a rheumatic subject, in the treatment of an abscess of the maxillary sinus, produced in consequence of the too prolonged retention of a first large molar, which was diseased, having caused many consecutive accidents in connection with caries of the fourth degree. I extracted this tooth, and, without entering into details, as is usually the case with an ordinary treatment of such an affection, I treated the abscess, excluding all other antiseptics, and employed only boracine. The second day the suppuration had already begun to diminish, and stopped entirely at the fifth day. That happened three months ago, and my patient has not suffered since. His gums, without being completely healed up, have, however, some time since, regained the normal color. This rapid result has been obtained by putting one coffeespoonful of pulverized boracine in the wound of the sinus, that I took special pains to rinse, before performing the operation, with boracine water of sixteen per cent.; the adding of the powder to the solution has the object of facili-

¹ Read before the World's Columbian Dental Congress, Chicago, August, 1893.

tating the absorption of the remedy by the mucus, and in a most direct way, consequently the most efficacious one. The first day I performed three dressings; the second, the third, and the fourth day, two dressings; the fifth day, only one. Every trace of infection has disappeared, and I have often seen my client since that time, enough to convince me entirely that he was thoroughly cured.

The second case is that of a party who, in consequence of a bad extraction of the left cuspid and of the superior incisor, had the anterior part of the maxilla broken in different places; his different teeth were all affected with caries of the fourth degree, which caused many chronic abscesses in the alveolus border and fistulæ in the gums. A month after the extraction of these teeth the patient felt some deep and continuous aching, and the abscess, instead of diminishing, was increasing every day.

It was at that time that he came to consult me to relieve him of his pain. Having detected the presence of sequestra, I cauterized an opening of about one centimetre in width, at the position of the right incisor. In the middle of the principal mass I was lucky enough to extract several deposits of some millimetres, and one measuring exactly a centimetre and a half by one centimetre. As soon as I finished this operation, I rinsed it a number of times with boracine water of sixteen per cent.; then I saturated the wound, so to speak, with some pulverized boracine, and placed a strip of saturated gauze at the orifice in order to prevent the closing of the cavity too quickly, a consequence which would not have permitted ulterior evacuation of the pus, and which also might have prevented my seeing if anything had escaped my investigation. The next day I observed that the abscess had disappeared, and that there remained hardly any trace of suppuration. I performed the same dressing as the day before, without leaving the saturated string. The next day everything was over. Eight days after, the gum had regained, if not entirely its primitive shape, at least its normal color, and no complication had ensued since. This demonstrated, in the first case, collection of considerable pus, which was stopped the fifth day after beginning the treatment; in the other case it was stopped the day after.

I think, therefore, it would be a good thing to generalize the employment, particularly for the buccal mucous membrane, which interests us the most. In order to sustain such results, I could not do better than quote the names of Drs. Galezowski, Landolt, Hubert, La Grange, etc., all of whom now employ boracine in all their clinics with great satisfaction. As a daily antiseptic, its use

is plainly indicated against putrefaction of food-particles which remain in the interstices of the teeth, and create an unfavorable element for the multiplication and the station of various microbes, which lodge in the buccal cavity, waiting a favorable opportunity to invade the different organs and produce some injuries. Altogether, I have tried to draw your attention to the employment and the virtues of this new antiseptic, that we salute as having made its entrance into the medical domain.

Believing in the results that it is undoubtedly called to render to our art, owing to its important qualities, it only remains to speak of the properties of this double salt as applied to the enamel of the tooth, and this will be the subject of a new study.

TREATMENT OF ABSCESS OF THE MAXILLARY SINUS.¹

BY DR. E. LECAUDEY, PARIS, FRANCE.

FOR more than thirty years I have cured among my clients over sixty cases of abscess of the maxillary sinus.

At first I employed a tin tube of one and a half millimetres in diameter, cut at each extremity, and with bent points, which I would fix in the inferior opening of the sinus. Experience taught me the length of time required in such a treatment, and the difficulty with which a fistula would close up. Having been a long time studying the subject, I once read a thesis by Dr. Veillard, treating of anal fistula, in which was described treatment with zinc chloride. The idea then struck me to apply the treatment to fistula of the sinus, and I obtained most excellent results.

The cases that I have oftenest treated were caused by the second bicuspid, less frequently by the cuspid and first molar. The treatment has generally lasted from eight to twenty-one days, and has never lasted more than six weeks. My observation has taught me that the more one dispenses with the small tube the quicker the fistula will close up. After having performed the extraction I wash carefully with hydrogen peroxide the cavity of the sinus. Then I inject the following:

¹ Read before the World's Columbian Dental Congress, Chicago, August, 1893.

Chloride of zinc, 1 gramme ;
Phenic acid, 0.5 gramme ;
Distilled water, 100 grammes.

In order to keep the fistula open, I place a little silk string, saturated with wax, and if, as rarely occurs, it will not close up, I take a small pencil of gutta-percha, which I saturate with a little chloride of zinc, place it for twenty-four hours inside of the fistula, and the edges close up by deep cicatrization very rapidly.

I have never had, owing to this method of treatment, any repetition of the disease.

Reports of Society Meetings.

AMERICAN ACADEMY OF DENTAL SCIENCE.

THE regular monthly meeting of the American Academy of Dental Science was held in the Boston Medical Library Association rooms, May 3, 1893, at 7.30 P.M., President Brackett in the chair.

President Brackett.—We come to the subjects of discussion for the evening, which are as follows: 1. "What are the advantages and disadvantages of the use of the matrix? (a) With gold. (b) With plastics." 2. "Should examining boards have power to grant certificates of qualification to undergraduates?" I believe Dr. Ainsworth is particularly interested in the first subject, and we shall be grateful to him if he will open the discussion.

DISCUSSION.

Dr. Ainsworth.—To me the advantages in the use of the matrix in compound approximal fillings of bicuspid and molars is very great. To begin with, let me say that I am, as a rule, an uncompromising advocate of contour work. I am also firmly of the opinion that we cannot better preserve approximal surfaces than by using non-cohesive or soft gold at the cervical wall. To make such a filling entirely of soft gold, either with or without a matrix, seems to me impossible. By the use of the matrix I fill approximal cavities one-third or two-thirds full with soft gold, building out a proper contour, and then finish with cohesive gold. It seems to me that it would be impossible to work without a matrix and attain

the same positive result. And then, if the matrix is properly formed and adjusted in place, the finishing of the filling becomes a simple matter. I have never been able to use the matrix to advantage with gold fillings in the front teeth.

Dr. Clapp.—I have here some specimens that I prepared for an altogether different purpose, but as many of them require the use of the matrix, I make no apology for bringing them.

An advantage of the matrix for gold fillings is this: it often saves cutting away tooth-substance in the process of shaping a cavity. For instance, in the case of an approximal cavity in a devitalized bicuspid. The cavity may be quite large, and at the cervical margin may be U-shaped. To start a filling with gold in such a cavity without a matrix is rather difficult. To facilitate this process the tooth is oftentimes cut squarely at the cervical portion, thereby reducing the tooth at its weakest point. These cavities can be filled with a matrix without this sacrifice of tooth-structure. Dr. Ainsworth has spoken of other advantages, such as the more rapid introduction of the filling and the labor saved in the finishing process. I cannot conceive of a case where a properly-adjusted matrix could be a disadvantage.

Dr. G. T. Baker.—I have used the matrix with a great deal of satisfaction, and have made it of various materials, some of which I have brought for your inspection. Here is a sheet of copper silvered on one side; it was the first material I ever used, and was suggested by Dr. H. A. Baker eight or ten years ago. This one is thin steel; and here is a piece of German-silver, also very thin. I have never used aluminum, but have seen it somewhere suggested for this purpose. We have not yet been able to successfully solder aluminum, which stands to its disadvantage. The other materials spoken of are very easily manipulated and soldered. I believe in making a matrix for each individual case; it can be done in a very short time, and is more satisfactory than using those we buy ready made. Here is a strip of brass which I use to a certain extent, which gives me a great deal of satisfaction.

Dr. Allen.—I wish to bear testimony to the great value of the matrix in my work. I use it principally in plastic fillings of all kinds. I have had some unfavorable results from its use in filling cavities with gold, but I attribute the want of success more to my lack of familiarity with the method than to the method itself. In using the matrix with gold fillings I have sometimes found them a little soft at the periphery, as I have been unable to thoroughly condense the gold around the outer edge of the cavity at the be-

ginning of the operation. To avoid this I first lay the foundation of the filling, covering the edges of the enamel before applying the matrix, after which I adjust it, and complete the operation.

Dr. Ainsworth.—I would like to ask Dr. Allen whether he commences his filling with cohesive or soft gold. I refer to compound fillings in bicuspsids or molars.

Dr. Allen.—Soft gold.

Dr. Ainsworth.—Do you have difficulty in condensing it at the cervical wall?

Dr. Allen.—Not more than at any other point.

Dr. Ainsworth.—The very places where you speak of failure I feel very positive of. May I ask what you use for a matrix?

Dr. Allen.—The steel plate.

Dr. Ainsworth.—And conform it to the original contour of the tooth?

Dr. Allen.—As nearly as possible.

Dr. Ainsworth.—What is your method of holding it?

Dr. Allen.—I hold it by means of ligatures or by a wedge.

Dr. Ainsworth.—May it not be that you hold it too positively at the walls?

Dr. Allen.—Possibly.

Dr. Ainsworth.—I am using a very thin cold-rolled steel, a steel that has a temper very similar to piano-wire. You can bend it to any desired position, and yet it has something of a springy nature. I form it as nearly as possible to the original contour of the tooth, and hold it in position by various methods. I often use the Perry separator, and then insert a piece of orange-wood at the cervical wall, not too tightly, but just tight enough to bring the matrix towards the tooth. Beginning with soft gold, I can force the matrix away, not only at the cervical wall, but all the way up, so that when it is taken off I have a cavity which is uniformly too full. Two-thirds of the surface is made of cohesive gold. With proper burnishers I can burnish the filling very nearly to a finish, leaving only a trifle to be done by the disks and strips.

Dr. Allen.—I thank Dr. Ainsworth for his suggestions, and would like to ask him if he shapes the edge of the cavity in any peculiar manner?

Dr. Ainsworth.—I shape the cavity with reference to filling it with a matrix, not having it too rounding, but very nearly on a plane, with just the feather-edge taken off. I then pack two-thirds or three-quarters of the filling with hand-pressure, beginning with my cohesive foil when I have yet sufficient undercut to hold the

filling. I do not know how extensively the matrix is used, but I feel that it is not adopted as it would be if all understood its advantages. I was for a time prejudiced against it, feeling that it would be impossible to pack gold properly in the places of which Dr. Allen speaks. And I thought that the finishing would consist more in working the tooth down to the filling than in working the filling down to the tooth, but this has not proved to be the case.

Another advantage in the matrix is that it enables us to restore the original shape of the tooth without previous separation. In the case of teeth which have never been filled or filed away, I do not care for separation obtained by the wearing of a wedge for two or three days or a week.

Dr. Allen.—My method of managing cavities where the matrix seems to be indicated is to use the adjoining tooth as a matrix.

Dr. Ainsworth.—You get a point by that means, but you do not get a uniform fulness. Your leverage is from only one spot. I venture to say that I can save one-fourth to one-third the time in filling an approximal cavity by using the matrix.

Dr. Meriam.—I think I am on record all I need to be as regards the materials to be used for matrices. I would speak again of the value of the optician's pliers, which give just the right curve for bending a matrix into position. Opticians use them for adjusting the spring of an eye-glass. They are not made in this country, but are imported by the American Optical Company.

One of the great values of matrices is in Dr. Clapp's method of confining a softer material so that it can be built on advantageously with a hard one. It thus helps out in those places where it would otherwise be difficult to retain a hard filling. I use it for this purpose quite extensively.

It is useful in molars in filling with amalgam when the cavity involves the mesial and distal surfaces. A matrix can encircle the whole tooth and be left on until the amalgam hardens.

There is an advantage in breaking up your amalgam chips and either mixing them with the fresh amalgam or embedding them in it. I think there is less contraction in an amalgam filling which is built into a hole. We speak of simple crown cavities as the simplest form of filling, and the question is suggested, "Do we not make a better filling when the filling-material is held on all sides against our pressure than when it is open on one side?" If we do, then it seems to me the matrix has a great value on that account alone. That idea is one which I do not think is on record. We know that of late years various drugs used in the form of pills or tablets which

were formerly compounded by the assistance of the various gums are now made to hold together by a powerful pressure. In that way you get a condensed substance. Just in proportion as a substance is porous, just in that proportion will it be acted on chemically. A phosphate filling made with a matrix is a harder filling, and, consequently, less liable to solution than one made without such pressure.

I generally hold my matrix in place with a steel wedge, of which I have had several made. They are wedge-pointed, and just fit into my automatic plugger. After driving them in, a slight turn leaves them in position. I also use the ordinary pine wedge, which has, to a certain extent, the advantage which Dr. Ainsworth speaks of in the orange-woods,—that is, it is not too rigid. I whittle the pine out to a proper size and then compress it with a pair of pliers. After putting in the wedge a drop of water causes it to swell and hold the matrix firmly in place, though not so firmly that it will not give a little. I have some of this soft pine with me, which I bought for horticultural purposes, and shall be pleased if the gentlemen will take as much as they wish of it.

Dr. Brown.—Ever since I have been in practice I have used the matrix wherever I could, thanks to Dr. Ainsworth's instructions. I find it helps me very much indeed, and I am sure I have accomplished results which I could not have without it.

Dr. Clapp.—I find it absolutely impossible to get along without the matrix in combination fillings of amalgam and gold. One of the great advantages of the matrix is the help it gives in making contour fillings. I have felt conscience-stricken repeatedly on account of the time used in filling when I have heard men who are called rapid operators give their experience. I had a short time ago a young man whose teeth had been cut down unmercifully, so that the spaces between most of them were V-shaped. At the cervical portion the teeth were close together, and I think in every instance where they had been filled decay had reappeared under the fillings. After I had worked some time on this young man, he told me, without any request on my part, who had had charge of his teeth, and I am sorry to say that the gentleman who did the work I consider to be the very best rapid operator there is in New England. Now, I have to contour those teeth in order to get them in any decent condition. The gums are very much inflamed from the impacting of food in the wedge-shape spaces. If it was not for the use of the matrix my work would certainly be very much more uncomfortable for the patient than it now is.

In teeth badly broken down by caries, the matrix is of great advantage. This specimen is a good representative. It is decayed down to the alveolar margin, not only on the distal surface, but a little on each side,—that is, both towards the palatal and labial surfaces. In such cases I adjust the matrix first and then put the rubber dam over it.

President Brackett.—I think we should express our sense of appreciation for this group of practical specimens that Dr. Clapp has been so kind as to put before us.

Dr. Meriam.—Having a distal cavity in a second molar, with the wisdom-tooth partly erupted, I made a matrix with an upper lip, which was bent backward, and formed a support for the rubber dam, which, without such help, could not be adjusted. This form of matrix changed a difficult operation into an easy one. You do not know how much cold-rolled steel can be forged without drawing the temper until you have tried it. You will find that you can make a knuckle by making a dent in the steel at the point desired.

Dr. Stevens.—There is one class of cavities that has not been mentioned in connection with the use of the matrix, and that is those shallow approximal cavities where the teeth are sometimes so sensitive that we cannot get undercuts to retain the filling. In such cases I oftentimes apply the matrix and fill in against it with amalgam, and then put soft cement between the amalgam and the wall of the cavity to insert the amalgam, and then finish with either gold or amalgam. In that way I get a filling that will stay without undercuts, and the work is very easily done.

Dr. Baker.—I sometimes make a matrix from a Parmly Brown polishing strip. The strip is bent about the tooth with pliers, and the ends soldered with soft solder. I used to solder with eighteen-carat gold solder, but the soft solder is just as good, besides being inexpensive.

Dr. Stevens.—I do not understand how you can solder a matrix and then get it over the contour of a molar tooth.

Dr. Meriam.—In the case I referred to the molar tooth was so badly decayed there was not much contour.

Dr. Ainsworth.—I have had several cases lately of bicuspid teeth that were very badly decayed, both upon the mesial and distal surfaces, so much so, in fact, that it was impossible to get sufficient retention to hold any filling excepting a cement. The pulps were alive, and enough of the buccal portion of the tooth remained to make a good appearance. In these cases I used a matrix made by passing

a piece of German-silver entirely around the tooth, drawing it together with the pliers, removing, and soft soldering. With a burnisher I arranged the contour on either side, having previously separated the teeth. By this means I have been able to fill a large part of the cavities on either side with soft foil. By building the top of the filling with cohesive gold, the distal filling held the mesial, and *vice versa*. And the result was a finely-shaped tooth, and one of great durability. This could not have been done without the aid of the matrix.

President Brackett.—Unless some one wishes to speak further on the subject we will consider the discussion closed on this matter and proceed to the second topic, which is, "Should examining boards have power to grant certificates of qualification to undergraduates?"

Dr. Stevens.—No.

Dr. Meriam.—I should like to ask if that applies to examining boards generally, or to examining boards in Massachusetts? It is no use for us to express our wishes in matters over which we are not likely to get any control. The same power which gives the colleges the right to grant degrees or to establish qualifications for graduation also appoints the examining boards. Now, the question is, how far our examining boards have a right to refuse to examine any man who chooses to present himself. We must not hold the idea that an examining board created by Massachusetts could refuse to examine any person, or, having examined a person, could refuse to issue a certificate if the examinations were satisfactorily passed, whether the person be an undergraduate or a graduate.

Dr. Stevens.—I would say, in reply to Dr. Meriam, that the topic reads, "*Should* examining boards have the power to grant certificates?" It does not say, "*Have* examining boards the power?" That is another question. It seems to me that the time has passed when examining boards should have the power to issue certificates to undergraduates. We have men come up before college professors who do not creditably pass the examination, and they go before the dental board, and are allowed to practise.

Dr. Allen.—Dr. Stevens's remarks suggest a matter that came under my direct observation. About a year ago a student of one of our dental colleges, nineteen years of age, after having had a little less than nine months' actual experience in dentistry, went before the State Board of Examiners and applied for a license to practise dentistry. The result was that in the course of two or three weeks a letter came to him, addressed in my care, which read

something like this: "Dear Doctor,—We have the pleasure of informing you that you have successfully passed the examination of the Massachusetts State Board of Registration in Dentistry, and that your certificate will be sent you in a few days." He received the certificate in due time, and with something less than ten months' experience came out a full-fledged dentist.

Dr. Meriam.—I do not see why the examination of the Board of Examiners should be so low. Some students pass who have not even matriculated.

Dr. Brown.—I graduated from the Boston Dental College in 1890, and the examination of the State Board was a very rigid one. Had I not taken the full course at the college I feel sure that I would not have been competent to pass. I do not understand how undergraduates are able to pass, though I know of a number who have done so. They must have been let off easily by the examiners.

Dr. Clapp.—I would like to ask Dr. Brown if, in his estimation, the examination which he received from our State Board was sufficient and satisfactory from a professional view.

Dr. Brown.—My examination was.

Dr. Clapp.—Do you think that the examination you passed would be sufficient to qualify any person to practise?

Dr. Brown.—It was certainly severe, both theoretically and practically.

Dr. Allen.—There must be a great many exceptions to the rigid examination which Dr. Brown passed. This young man that I speak of is an intelligent young man, but not remarkable as a student. He was not a graduate at the time of taking the State examination, and has not graduated yet; and it is doubtful if he will succeed in passing the dental school examinations this coming year. In the first year examinations he failed on anatomy, chemistry, and another study; he was conditioned on these three studies when he applied for examination at the State Board. His first filling was put in only six months or so before his State examination, and they passed him and gave him his certificate.

Dr. Payne.—I graduated in 1889, and took my State examination at the same time, and was only asked six simple questions.

WILLIAM H. POTTER, D.M.D.,
Editor American Academy of Dental Science.

Editorial.

THE WORLD'S COLUMBIAN DENTAL CONGRESS.

It is always difficult to arrive at satisfactory conclusions regarding the result of the deliberations of a large body assembled in any given capacity, and doubly so when this convocation of persons has met together ostensibly for a special scientific purpose. The great variety of mind to reach and satisfy not only renders it necessary to have the proceedings cover a wide scope, but it also naturally causes a diversity of sentiment regarding the ultimate value attained.

That this was true of the recent Congress must be conceded by all those present at its deliberations. It was to all intents and purposes a mass-meeting of the dental profession, and as such can lay no claim to have been a scientific body. It was organized for a special work, to bring dentists from all parts of the world in unison for a limited period, and if it served a purpose in measurably breaking down the bars of prejudice occasioned by nationalities, various languages, isolated conditions, and crude conceptions of professional work, it, perhaps, accomplished as much as could reasonably be expected.

That this view was not the one hoped for must be acknowledged. It was anticipated that the sessions of this Congress would mark an epoch in scientific dentistry, and probably lead to more extended gatherings of a similar character on great occasions in other parts of the world. Whether this will be the result time alone can determine.

The hour has not yet arrived to review the work of this Congress or to do justice to it, for the official record is not before us, and while that made by the faithful corps of reporters is satisfactory, it does not embody all the work laid out and probably completed by the committees.

While this is recognized, it does not absolve the conductors of journals representing the profession from a duty pressing upon them to give their views regarding the work performed and the possible results.

We felt called to repeatedly urge upon the committees in charge the importance of making this Congress truly a scientific convention,

and we have also at times freely criticised what, in our judgment, seemed to endanger the success of the undertaking. We felt, in common with the best thought of the dental profession, that this Congress should be an epoch-making gathering, and in order to accomplish this it should, in every sense, represent the best scientific mind of the world. That this view was not accepted by the committee in charge was, in our opinion, the first fatal step which led, by a series of mistakes, down to a conclusion not creditable to American dentistry.

It is not desirable at this late day to recur to the lamentable error of the earlier organization. That first false step led to subsequent mistakes, until the final organization of the Congress, which, to our view, was the most open to criticism of any that had preceded it. It early became apparent that this Congress could not be anything more than an aggregation of uncertain elements. No rules were elaborated in advance to prevent the entrance of undesirable persons, and the means subsequently adopted to attain this end were not calculated to effect the result. There was some effort made to discover the professional standing of certain parties, but in the rush of applications for membership this practically amounted to nothing, and seemed to be finally abandoned, as all who applied and could pay the amount demanded were furnished with a certificate.

The committee on the organization of this Congress was appointed by the American Dental and Southern Dental Associations to arrange the preliminary work of this meeting. The original resolution was adopted at Excelsior Springs, Missouri, in 1890, and the following is the essential part, italics ours: "When this committee is so completed it shall be clothed with full power to take such action as it in its judgment may deem best for *creating an organization* for the purpose of holding a dental meeting in Chicago in 1893." It was never contemplated by the former body, for we cannot speak for the latter, that this work should extend beyond the preliminary organization, and that accomplished, the labors of the committee practically ended. This, however, was evidently not the idea entertained by this body. It was assumed that it possessed not only full power to organize, but was to be in all essentials *the Congress*. It made the rules for the government of the latter, prescribed how these should be carried out, and refused absolutely to permit any one even to suggest a modification. In a word, the only privilege they accorded was to sit in the general meeting and take part in the discussions of the sections.

The arrangement of the Congress into one general meeting at twelve o'clock (noon), and into eight sections in the afternoon, was another almost fatal mistake. The explanation was that the work could not be accomplished in one general meeting. It was clearly apparent that all interest would be sacrificed by this subdivision, but as no one was permitted to find fault with the arrangement, it was acceded to as the only thing possible under the circumstances.

The excuse that there would not have been time to have read and discussed all the papers would have been a valid one if all such presented had been worthy of this Congress; but they were not.

The Committee on Essays had, doubtless, an unpleasant task before it, but, disagreeable as it was, the duty of selection should have been performed without fear or favor. It would seem from the result that it concluded to accept everything presented, good, bad, and indifferent, and let the Congress be the judge of their merits. The meetings were, therefore, served with a singular mixture of a few good papers, some of doubtful value, and a large number which would discredit any small local society. An analysis of fifty-seven papers presented to the Congress, exclusive of addresses, gives, in the judgment of the writer, the following result: Fourteen which can claim a place as worthy of consideration, among these several of rare scientific value, seventeen fairly good articles, and twenty-three that should have had no place at such a meeting. Three others were admitted after they had been repeatedly read, at least in substance, before societies and published in the journals. If the twenty-six papers had been rejected, and the convention called together at 10 A.M., ample time would have been given to have had them read and considered in a dignified manner. Washington Hall would have comfortably accommodated the entire body, and as there is always life in numbers, the discussions would have been varied in character and valuable in results. That such would have been the case was demonstrated in other congresses held in the same building, where this subdivision was not attempted.

While it is not possible to call a congress an absolute failure where over a thousand dentists assemble from all parts of the world, this one cannot be called a great success, and for the reasons given. Outside of the professed enthusiasm over the result manifested in certain journals, there is a universal feeling of disappointment.

The arrangement for clinics was beneath criticism, and we shall not attempt it. The operations, to the few, may have been valua-

ble, but for the majority to see them was impossible, while the intolerable atmosphere, coupled with the noise made by the officials, rendered it simply unbearable. This portion of the programme could have been omitted without serious detriment to the Congress, and with gain to the reputation of those who managed this portion of the work.

Whatever of good this Congress accomplished will be made manifest in the published transactions, but we certainly feel assured that if international congresses are to be a part of the programme of the future the mistakes of this must be avoided. The only true course to prevent difficulty is to have international conventions delegated bodies, and when once convened let the control be in the hands of those sent as representatives. This kind of an international congress, conducted on scientific lines, must commend itself to all right-thinking minds, but it is hoped that international mass-meetings will end with the World's Columbian Dental Congress of 1893.

TO CORRESPONDENTS.

THE necessity of giving a portion of the selected papers read at the Columbian Dental Congress has forced the enlargement of this number, and has obliged us to defer much interesting matter until the next issue. We ask the indulgence of our regular contributors.

THE CONGRESS REPORT.

WE present our readers in this number with papers selected from the large number read at the Columbian Dental Congress. Arrangements were made prior to this meeting to give a continued report of the proceedings, but finding this would result in very little profit to our readers, the present course was adopted as being the most satisfactory. All of the papers selected for this and the succeeding number will bear careful reading, and several of them are of rare scientific value.

Domestic Correspondence.

CORRECTION.

AUGUST 23, 1893.

TO THE EDITOR:

SIR,—May I beg you to correct my remarks on page 593 of the August number of your journal? I quote from the report:

"It is generally understood by the gentlemen present that the dental dealers took a great deal of trouble to see that the clause covering dental goods in that tariff was enacted."

The S. S. White Dental Manufacturing Company assert positively that *they* did not use or try to use any influence with anybody with the object of affecting the rate of duty on a single article mentioned in the McKinley bill.

The president of that company informs me that he was opposed personally to any increase in the rate of duties.

E. A. BOGUE.

Notes and Comments.¹

AN INTERESTING CASE.—A young lady, about seventeen years of age, called for treatment. She was suffering from severe pain in the region of the right superior lateral incisor. In her own words, "suffering from neuralgia in the front teeth on the right side," and wished the lateral incisor extracted, as it was loose and had caused her trouble enough, etc. Upon examination we found the teeth in remarkably good condition for a girl of this age, excepting the tooth mentioned, it being slightly loosened; we also found a slight bluish line running through the gum over the root of this tooth and part way across the adjoining central incisor. Upon inquiry as to her ever having received a blow or a fall injuring these parts, we learned from her mother that about five years previous to her

¹ The assistant editor solicits contributions for this department,—new methods, new remedies and formulas, or any short practical note which may prove of value to the practitioner or student. Address 1506 Arch Street, Philadelphia.

visit she fell, striking the parts upon the point of a lead-pencil; but both the girl and her mother, in response to our questions, felt sure that the pencil was all drawn out at the time. However, after some persuasion, the patient allowed us to make an incision and explore the parts.

We found the lower border of the process absorbed over the root of the lateral incisor, and a small piece of the pencil lying directly over the root; also another piece, possibly a quarter of an inch in length, that had been forced endwise between the central and lateral incisors. It was so tightly embedded that we did not remove it in one piece, but found it necessary to dissect it out, a small piece at a time. The wound was then dressed and the patient dismissed. She was not heard from for several weeks, when the report was made that "the loose tooth had grown tight and the neuralgia had disappeared."

BUSINESS AND PROFESSIONAL METHODS.—In a very practical paper, published in the *Dental Register*, Dr. C. B. Blackmarr urges the importance of conducting one's practice in a business-like way. He says, in speaking of a fellow-practitioner, a most excellent and conscientious operator, that it was pitiful to see him try to make his income pay expenses, and as he is growing older the struggle is growing harder. He goes about his work in about this manner: he will examine the tooth several times with mirror and explorer, and talks to the patient long enough about what would have to be done under certain circumstances, etc., for many operators to perform the operation. Then in making an appointment, he says, "Come at half-past one or two," and as he was not exact in regard to his time, the patient was not in coming, and came at nearly half-past two. The tooth was filled and finished about half-past four,—too late to wait upon another patient. Then, upon being asked the amount of his fee, he reasoned this way: "One hour's consultation and two hours' operating." And yet he cannot imagine why, in a business sense, his professional career is a failure.

We are familiar with numerous cases somewhat similar, where the man or woman fails to combine business methods with professional principles. This case is cited here, however, as a hint, not only to students and the younger members of the profession, but to some who have been plodding for years and are still wondering why they fail to succeed.

Current News.

CHICAGO DENTAL SOCIETY.

At the annual meeting of the Chicago Dental Society, held Tuesday evening, April 4, 1893, the following officers were elected for the ensuing year:

President, J. W. Wassall; First Vice-President, J. H. Woolly; Second Vice-President, Garrett Newkirk; Recording Secretary, L. L. Davis; Corresponding Secretary, Geo. J. Dennis; Treasurer, E. D. Swain; Librarian, J. H. Smyser.

Board of Directors.—Edmund Noyes, J. G. Reid, Geo. H. Cushing.

Board of Censors.—C. R. E. Carpenter, D. C. Bacon, H. W. Sale.

GEO. J. DENNIS,

Corresponding Secretary.

DENTAL LAW IN THE TERRITORY OF NEW MEXICO.

THIS law, approved February 23, 1893, provides for the appointment of five practising dentists as a Board of Dental Examiners. This Board is to meet at least once a year.

Section 4 requires that all persons engaged in the practice of dentistry shall file an application for a certificate to continue in practice, and those who have been in practice for "one year next preceding the passage of the act" are entitled to receive a certificate without examination.

All unregistered persons will not be permitted to practise dentistry in the Territory until regularly examined.

Persons presenting a diploma from a college recognized as reputable by the National Association of Dental Examiners will be entitled to receive a certificate upon the payment of five dollars.

SOUTHERN DENTAL ASSOCIATION.

THIS Association met at Kindergarten Hall, Chicago, August 11, President Dr. B. Holly Smith in the chair.

The Executive Committee reported that, under the unusual circumstances, it was deemed best that the Association should

adjourn until the next annual meeting, the present officers to hold over until then.

The books of the secretary and treasurer were found correct, and it was suggested that the dues for this year be remitted.

Upon this latter point there was some discussion, but the president decided that a unanimous vote would make the action legal. Dr. McKellops then offered a resolution to remit the dues for this year. It was unanimously adopted.

Charges were made against a member resident in Rome, Ga., of having violated the code of ethics in advertising a patented plate. Drs. Gordon White, N. A. Williams, and M. W. Foster were appointed a committee to correspond with the party charged in the complaint, and instructed to report at the next annual meeting.

On motion, the officers were permitted to hold over until the next annual meeting.

The selection of the place of meeting was, on motion, left with the Executive Committee, with instructions to report within six months.

Adjourned.

RECENT PATENTS.

FOLLOWING is a list of recent patents, reported specially for the INTERNATIONAL DENTAL JOURNAL:

Trade-Marks.—23,027.—Dental Remedies and Specifics. Milford L. Pine, Fabius, N. Y. Filed April 10, 1893. Essential feature the word "Nopain."

23,176.—Anæsthetic. Hale Dental Company, Boston, Mass. Filed May 5, 1893. Essential feature the word "Orinda."

23,179.—Tooth-Brushes. Florence Manufacturing Company, Florence, Mass., New York, N. Y., and Chicago, Ill. Filed May 15, 1893. Essential feature the words "Dental Plate."

33,067.—Dental Rubber. Edward J. McCormick, New York, N. Y. Filed April 25, 1893. Essential feature the word "Anaconda."

493,800.—Dental Plate. John R. Watson, Smithfield, Pa. Filed October 7, 1890.

493,843.—Dental Plate. Johannes A. A. Schoondermark, Leeuwarden, Netherlands. Filed July 5, 1892.

THE International Dental Journal.

VOL. XIV.

NOVEMBER, 1893.

No. 11.

Original Communications.¹

COCAINE.²

BY CHARLES P. BRIGGS, M.D., D.M.D., BOSTON.

IN my practice I find it necessary to use a great deal of cocaine ; I use it principally for the removal of living pulps. For this purpose it is necessary to employ a twenty-per-cent. solution. Without much exaggeration, I may say that I have used quarts of a solution of this strength, and never, saving on two occasions, have I seen any unpleasant effects. On July 7, 1891, I met with a case which I considered one of cocaine-poisoning.

The patient was a young girl, thirteen years old. She had an exposed pulp in the left superior first molar which, as she was going to the mountains on the following day, it seemed desirable to remove with cocaine. As the tooth was so broken down that it was impossible to apply the rubber-dam, I enclosed the tooth as securely as I could in napkin and bibulous paper each time that I used the solution, and after each injection had the patient carefully rinse her mouth with water ; I cautioned her, moreover, against swallowing. All went well, and I had nearly finished the removal of the pulp when the girl said to her mother, who was standing near us,

¹ The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

² Read before Harvard Odontological Society, July 1, 1893.

"Mother, I see grandmother standing there, and she tells me to be of good cheer." So strange a remark recalled the hallucinations often present in cocaine-poisoning. I looked at the patient, my attention up to that time having been given to the work in hand, and saw that her face was cyanotic. To my questions she said that she felt "queer," and complained of a strange sensation in her chest. I felt of her chest over the heart, and found the heart beating at a tremendous rate, so forcibly that it easily could be felt through the chest-wall. Now thoroughly alarmed, I placed her in a recumbent position, gave her inhalations of ammonia, subcutaneous injections of ether and brandy, and vigorously slapped her hands. I soon had the satisfaction of seeing her face regain a more natural color, and of finding that her heart-beats were coming down to a more regular and more normal rate. Several times the cocaine seemed to get the upper hand, and the heart would beat irregularly, rapidly, and violently, but extra stimulation would bring it back to a normal condition. It was, however, two hours before I considered it safe for her to rise from a reclining position. She felt dizzy and weak, and did not sleep any through the night following, her mother afterwards told me, but suffered no further inconvenience beyond a soreness of the arm at the points where I had injected the ether.

Since that time the removal of the pulp by cocaine has been an operation satisfactory as before in its results, but attended by a certain loss of nervous vitality on my part for which it is hard to find compensation. Not that the case could be considered gravely dangerous, but when I reflect that toxic effects have been observed after the application of three drops of a twenty-per-cent. solution to an exposed pulp, I am hindered in my work by a haunting fear that some day I may meet with symptoms not so easily controlled.

Once again I have had alarming symptoms; this time the rubber dam was in place. Inhalations of nitrite of amyl and internal administration of brandy obviated the symptoms, which it is fair to say might have been attributed to the apprehension of the patient and to the shock of the operation.

Basing my conclusions as to the dangers of cocaine upon my own experience, having seen but one case in a great many administrations where the effects plainly were to be ascribed to cocaine, I should say that, with reasonable precautions, it was safe to inject twenty-per-cent. solutions into the pulp-cavity; but when I read the literature on cocaine-poisoning, I question whether I may not have been unusually fortunate.

Dr. E. C. Kirk, in a valuable paper entitled "Local Anæsthetic

Nostrums," read before the First District Dental Society of New York, tells us that chemical analysis shows that most, if not all, of the thousand and one nostrums now in the market for the "painless extraction of teeth" contain cocaine; in nine, the analysis of which he submits, the amount runs from 1.46 (the smallest) to 5.68 per cent. To those who use these preparations it may be interesting to hear some of the testimony, for and against cocaine as a local anæsthetic, that I have been able to collect.

Opinions as to its effects are as much at variance as are the toxic symptoms. Where one investigator says that it is of inestimable benefit to mankind, another asserts that it is more pernicious in its effects than can be described. Among those who take an adverse view is Dr. Edmund Falk, of Berlin, who, in an article published in the *Therapeutische Monatshefte* of October, November, and December, 1891, gives a most exhaustive account of the effects of cocaine; in it he has given a list, in tabular form, of one hundred and seventy-six toxic cases, including ten deaths,—a collection made from all the available medical literature up to that time, including all the reported cases.

As the cases of poisoning from local application to mouth and throat and from subgingival injection are especially interesting to us, I give a translation of all the cases he has collected that come under these two heads. Dr. Falk's analysis of the one hundred and seventy-six cases is as follows:

When taken internally, the smallest dose after which toxic symptoms were observed was six- to nine-tenths of a grain. Death followed the injection of eighteen grains in one case and twenty-two grains in another, while very grave symptoms were seen after fifteen grains.

When applied locally, the poisonous dose depends upon the site of the application. Thus, while after injection into the bladder the smallest dose after which toxic symptoms were seen was fifteen grains, and an injection of eighty grains was not fatal, very alarming symptoms were observed after the injection into the urethra of fifteen drops of a three-per-cent. solution (one-third of a grain), and death resulted after the injection into the uterus of twelve grains, and after twenty-two grains into the rectum. After application to the nose of less than a quarter of a grain, after similar small doses to the external auditory canal, after eighteen-hundredths of a grain to the mucous membrane of the mouth, grave symptoms were seen. Painting of the larynx with a four-per-cent. solution caused poisoning. Extremely small doses to the conjunctival membrane, which

seems to be peculiarly absorbent,—as, for example, six-hundredths of a grain,—caused poisoning. Death followed the subconjunctival injection of six-tenths of a grain.

Wölfler, in 1889, showed that in twenty-three cases of poisoning by subcutaneous injection nineteen were about the head, one in the larynx, and the three remaining were not to be considered, as the dose was excessive. This would tend to show that the head is an especially dangerous place for subcutaneous injection of cocaine. Hunt, in the *London Medical Recorder*, states that the mouth is the most dangerous place for its use. L. C. Anderson, in the *New York Medical Journal*, makes the same statement. But Falk's analysis of the poisonings from subcutaneous injections in his list does not confirm this. In twenty-eight of the cases the injection was made into the trunk, in nine into the extremities, and in seven into the head. Adding to these thirty-six cases of injection into the gums and five cases into the conjunctiva, we have forty-eight injections into the head and thirty-seven into other parts of the body. The amount injected into the extremities was not excessive,—that is, three grains was exceeded only five times, while about the head this amount, or more, was given six times. The smallest dose which produced toxic symptoms was two-thirds of a grain injected into the trunk, one-sixteenth of a grain into the forearm, and rather more than two-thirds of a grain into the head. From this it would seem that the site of the injection does not especially influence the production of toxic results.

The cases of poisoning from local application, however, show, as one would expect, that the dangerous dose depends upon the site of the application, owing, probably, to the varying rapidity with which the drug is absorbed in different parts of the body. The conjunctiva is a very rapid channel; after that the nose, mouth, and ear. In these situations one-third of a grain may generally safely be used. Then come the urethra, uterus, and rectum, for which the dose should not exceed one and a half to two grains. Fifteen grains may be injected into the bladder, if it is intact.

Besides depending upon the site of the application, whether local or subcutaneous, the poisonous dose seems to depend upon the ability of the individual to tolerate the drug. It must be said, however, that there are cases of poisoning in the list from doses which had previously been used in the same individual without untoward results.

Mannheim asserts that old, poorly-nourished individuals are peculiarly susceptible. As regards age, Falk's list shows that ten

cases were between one and ten years of age, seventeen between ten and twenty, twenty-three between twenty and thirty, eighteen between thirty and forty, seven between forty and fifty, four between fifty and sixty, five between sixty and seventy, and three between seventy and eighty, the greatest number being between twenty and thirty. As to the type of patient, the list shows that nervous, anæmic individuals are peculiarly liable to evil after-effects. Lepin and Lewin say that this is so. L. C. Anderson, in the *New York Medical Journal*, says that patients of a cyanotic type and of sluggish respiration bear cocaine badly. Sleigh, in the *Buffalo Medical and Surgical Journal*, makes the same statement.

A summing up of Falk's conclusions would be that cocaine is unreliable and dangerous; that one can never feel sure that a dose which ordinarily may be considered safe may not be followed by alarming symptoms.

There are, however, as has been mentioned, those who hold a far different opinion of the matter. Among others is one whose name carries a great deal of weight,—Paul Reclus. Jules Auber, a disciple of his, in a pamphlet published in Paris in 1892, attempts to prove that cocaine, wisely administered, is as safe as any of the alkaloids. "There are to-day," he says, "in Paris hospitals hardly three services where cocaine is not constantly used, while in other parts of Europe, Lander, Wölfler, Albers, and others have come forward as its defenders." At a conference of German surgeons at Heidelberg, Albers expressed his astonishment that cocaine was not more widely used, and stated his conclusions as follows:

(1) Solutions of five per cent. are best for deep cutaneous incisions and for the removal of large tumors. Stronger solutions are unnecessary.

(2) Solutions of this strength, injected after Reclus's method, are preferable to chloroform, on account of their harmlessness and because of the greater rapidity of action.

Auber gives it as his opinion that the dread of cocaine arises from the fact that great errors have been made in the reports of cases; that symptoms have been grossly exaggerated; that many of the symptoms recorded may be ascribed to emotional causes. At this point it may be interesting to mention a case reported by Hugenschmidt. He was called to administer cocaine to a woman sixty-nine years of age, who was about to submit to a painful dental operation. He found her in a very excited and nervous condition, owing to the fact that her physician had told her that the operation (the injection of cocaine, that is) was a very dangerous one.

In this state of affairs, Hugenschmidt refused to give the injection; but persuaded by the woman to do so, he pretended to follow her request, but, as a matter of fact, injected ten drops of distilled water. In less than thirty seconds the patient complained of terrible pain in her head, rose, tottered to a sofa, and fell, saying, "I am dying!" She then fell into a state of syncope that lasted half an hour.

It is the attempt of Auber, in the pamphlet mentioned above, to prove that, with proper precautions, cocaine in hypodermic injections is not dangerous. At the writing of his paper, sixteen fatal cases had been reported. His contention is that none of these were due to a moderate dose of cocaine hypodermically administered. Two of the cases, he claims, are identical with two others in the list, reported as separate cases through mistake. A third case reported as fatal was in reality not fatal. Two other cases are thrown out, as death followed the ingestion, not the sub-cutaneous injection, of cocaine, and that in excessive doses. Of the eleven remaining cases, death was due in the first to the injection into the urethra of twelve grains; the injection was not submucous, and here again the dose was unwarrantable. In the second, death followed the injection of eight grains into the tunica vaginalis for hydrocele. The autopsy showed a serious valvular disease of the heart, to which, and to the excessive dose, the result could be ascribed. In the third case four injections of a five-per-cent. solution were made into the breast for mammary cancer, making a dose of three and a third grains. When most operations can be made with from eight- to nine-tenths of a grain, the dose may be considered excessive. The fourth case is the well-known one of Kolomin's, who was about to operate for ulceration of the rectum. Turning to one of his staff, he asked the dose of cocaine, and was told two to three grains. He injected twenty-four grains. Death followed in spite of all means for resuscitation. This death led to the suicide of Professor Kolomin.

The next three cases Auber skips lightly over, inasmuch as the cocaine was not given subcutaneously; but as they are all cases where the poison was absorbed through the mouth and throat, and as the solution used in two of them was of a strength usually considered safe, it may be interesting to hear of them somewhat in detail. The first of these three was that of a man whose larynx was sprayed three times with a four-per-cent. solution, the quantity unknown. Two hours afterwards he lost consciousness. His respiration was feeble, pulse twenty. Whiskey was injected under his skin, and in half an hour he regained consciousness. He grad-

ually recovered, barring a feeling of weakness. Five days later two applications of a two-per-cent. solution were made. Two hours and a half afterwards the patient showed the same symptoms as before. Whiskey was injected, but he soon ceased to breathe. The heart continued to beat for some moments, but all efforts, including artificial respiration, failed to revive him.

The second case is reported by Dr. E. M. Thomas, of Leonardville, Kansas. He was called, October 23, 1885, to a woman thirty-nine years of age. He found her unconscious, with pulse thirty-five, irregular and intermittent, and respiration feeble. Temperature normal. Right pupil normal, left widely dilated. Right arm and the legs paralyzed. The left arm and upper part of the body twitched spasmodically. Twice during his stay she vomited parts of her meal of the evening before. Flow of saliva increased. In spite of all efforts, she died. He had applied a solution (four-per-cent., quantity unknown) to her gums for dental neuralgia.

The third case was that of a pharmacist, who, believing that he had diphtheria, applied powdered cocaine to his tonsils, at intervals, for seven hours. At the end of that time he manifested alarming symptoms and soon died.

The next case—the eighth—was that of a girl who was given a subcutaneous injection of four to twelve drops of a four-per-cent. solution (three-tenths of a grain). Forty seconds later she became unconscious, and died in one minute. She had a degeneration of the heart following scarlet fever, which, together with the effect of a dose of cocaine, ordinarily safe, added, proved fatal.

In the next case death followed a small dose subcutaneously administered; but the autopsy showed a cerebral hemorrhage which, to the satisfaction of the physicians present at the autopsy, was the cause of death.

The last case is one which will especially interest us, so an account of it is given in full. On August 7, 1890, Mlle. Delcambre went to the office of Dr. Bouchard, in Lille. Dr. Bouchard reports the case as follows:

“ Mlle. X. came to my office August 7, 1890, to make an appointment for the following morning at seven o'clock. After making two injections of a one-per-cent. solution of cocaine, I proceeded to extract the two superior wisdom-teeth. The teeth were successfully extracted. After several minutes the patient expressed a desire to have me extract a third tooth on the left side of the lower jaw. I injected the rest of the cocaine in my syringe; after some minutes I extracted the tooth. The patient seemed quite comfortable,

though a little weak. Not foreseeing any accident, I left her to get her a cup of coffee. On my return I found that she had fainted. I laid her on the floor. After loosening her dress and her corsets, I rubbed her, dashed cold water on her, and, in a word, did all that my therapeutics would suggest. Physicians called in haste tried the same means, and in addition gave the patient injections of ether, inhalations of nitrite of amyl and of oxygen. All was in vain. At the end of half an hour she died. At the autopsy a double cord was found tied so tight around her chest that it was impossible to get a scalpel between the skin and the cord. The medical experts and the judges with them have admitted that the patient, very much frightened, had had an attack of syncope, induced not by the cocaine, but by fear, which, thanks to the impediment offered to the respiration by the cord of discipline, had been fatal."

The *Journal für Zahnheilkunde*, reporting the case, states that the dose was one grain given in three doses.

Dr. Bouchard was acquitted of the charge of homicide, but fined a few francs for practising medicine without a license.

Summing up these cases, Auber asserts that in none of them was death due to the effects of cocaine when administered in a safe dose. There are unpleasant symptoms occasionally after cocaine, even in safe doses, but nothing that cannot easily be controlled.

The method of administration of the injections is of great importance. It is necessary to have no fear of the operation, for by a timorous demeanor the operator will suggest to the patient the possibility of danger. The patient should not be anæmic or hysterical, should have no heart-trouble. The clothing should be such as not to impede the respiration. It is of the utmost importance that the patient be placed in a horizontal position and kept there throughout the operation. Dujardin-Beaumetz has drawn attention to this point. He mentions several cases where the patients have suffered from vertigo, syncope, or sensory illusions when sitting up, but were free from these symptoms when lying down.

It is better to give the injection on a full stomach. It is necessary to have the patient drink a glass of whiskey half an hour before; and if during the operation—the operation for which the cocaine is used—he shows signs of pallor, he should be given another glass. The syringe should be aseptic. The cocaine should be dissolved at the time of the operation in water recently boiled. The dose should not exceed six, eight, or ten centigrammes (0.926, 1.235, and 1.543 grains respectively), which suffices for the most extensive operations. But the most important thing is the strength of

the solution. It may be two per cent. for smaller operations which call for two to four centigrammes of cocaine; for those calling for six, eight, and ten centigrammes the solution should be one per cent.

For a long time Reclus has drawn the attention of surgeons to the fact that solutions of a low per cent. are, much out of proportion, less harmful than the more concentrated ones. At a meeting of the Société de Chirurgie, in December, 1891, he announced that he should make it a practice to use one-per-cent. solutions. In the first part of the year beginning January, 1892, he operated six hundred times without any alarming symptoms. Writing in the *Revue Scientifique*, March 26, 1892, he says,—

“The dangers of cocaine depend not only on the total amount of the alkaloid injected, but in a great measure upon the strength of the solution as well: the feebler the solution, the more the cocaine is diluted, the less are accidents to be feared. For example, ten centigrammes of cocaine in a one-per-cent. solution are much less to be feared than in a two-, and especially in a five- or ten-per-cent. solution. I have at this hour operated five hundred times, perhaps, when I have exceeded my maximum dose of ten centigrammes, using a one- or two-per-cent. solution.

“*Eh bien!* I should not have dared to inject the same amount in a ten-per-cent. solution.

“And this is easily understood. The solution injected under the skin is absorbed by the vessels which convey it to the nervous centres, where it exercises its harmful action. If the solution is a one-per-cent., it is ninety-nine parts water and one of cocaine that in a given time reaches the nervous centres; if it is a five- or ten-per-cent., it is five or ten parts cocaine that reach the brain in the same time. I insist on this point, for you must understand that in less than six years I have performed seventeen hundred and thirty-nine operations of all kinds, of all degrees of gravity, in all parts of the body, without having to deplore a single accident, while numbers of my colleagues—almost all, I might say—have been alarmed, if nothing more, by doses often more feeble than mine, but in stronger solutions.”

Reclus himself, when using five-per-cent. solutions, had several accidents.

In injecting, it is necessary to observe the following rules laid down by Reclus. The injection should not be hypodermic, but endermic. The needle should be pushed along parallel with the surface; if there is resistance to the advance of the point, we may know that it is still in the derma. If the point slips easily along,

we may infer that it has gone too deep, into the subdermal connective tissue.

M. Moty agrees with Reclus, that the dangers of cocaine depend upon the strength of the solution. He records the extraction of five to six thousand teeth, with cocaine, without accident.

Magitot (*British Medical and Surgical Journal*), following Reclus's teaching, concludes that cocaine is an excellent local anæsthetic, and should not be banished from surgery; that the dose should be proportionate to the extent of surface to be anæsthetized; that it should not be employed in patients suffering from chronic affections of the respiratory organs, or in those of well-marked neurotic diathesis; that patients should assume recumbent positions, and that it should be given in divided doses at intervals of some minutes.

Anton Bleichsteiner (*Wiener Klinische Wochenschrift*) mentions three thousand cases in two years, mostly for extraction of teeth, with no bad symptoms.

THE TEETH AND HAIR: THEIR HOMOLOGY AND PATHOLOGICAL INTIMACY.¹

BY DR. S. H. GUILFORD, PHILADELPHIA.

Two opposite conditions are of especial interest to the scientific mind: one, the highest development of the individual; the other, some variation from the normal type. The first illustrates the perfect working of laws when not antagonized by adverse conditions, and the second how a variation may result from some slight disturbance of their operation.

One condition is as instructive as the other, for it is often only through the consideration of an abnormality that we are led to appreciate the harmony of co-ordinate parts and their adaptation to function.

Perhaps no organs of the human body exhibit such a variety of aberration from the normal type and number as the teeth, and this fact further furnishes a field for observation and study. The subject is broadened and the interest intensified, when we consider the

¹ Read before the World's Columbian Dental Congress, Chicago, August, 1893.

teeth in relation to other organs or structures with which they are intimately associated.

Of the epithelial products, the hair, next to the teeth, is the one that is most frequently found to be abnormally affected; and the fact that these two structures have often been found to be conjointly influenced, long ago attracted the attention of scientific observers, but seems never to have received the careful investigation that its importance demands.

In approaching this subject it will be necessary to first briefly consider the origin of each of these structures. The ovum of the vertebrates consists of a mass of protoplasmic matter contained in a connective-tissue envelope. By a process of segmentation the ovum produces a vast number of cells that form a membrane known as the blastoderm, and this eventually is resolved into three layers, respectively denominated the epiblast, mesoblast, and hypoblast. "From the epiblastic or upper layer are formed the epiderm or cuticle of the skin and all its appendages, such as the hair, nails, and enamel of the teeth; also the brain and nerves. From the mesoblastic or middle layer are formed the true skin, cartilage, bones, muscles, dentine, and cementum of the teeth, etc. From the hypoblastic layer are formed the epithelium of the mucous membrane and the various glands of the alimentary canal." (Cryer.)

Hairs are a product, therefore, of the epiblast, and are developed inside of pouches or sacs from the infant cells of the rete Malpighii which dip into the underlying corium. As they develop they push their way to the surface, attain their normal length, are shed, and again replaced by others. They are nourished by a formative organ known as the follicle.

Hair of varying length and fineness covers the entire external surface of the human body, with the exception of the soles of the feet, palms of the hands, the eyelids, the last phalanges of the fingers, and certain portions of the genital organs. Its greatest length is attained on the head, especially of the female, upon the cheeks, chin, and upper lips of the male, and in the pubic and axillary regions of both sexes. Darwin says, "Hair is first developed in human fetuses at about the third or fourth month, when it appears on the eyebrows and face, and especially round the mouth, where it is much longer than on the head." At this early period of intra-uterine life no difference is noticeable between the male and the female fetus in regard to the abundance or location of this growth, whereas in early childhood, and especially after puberty, the difference between the sexes in this respect is very apparent.

The downy growth of lanugo with which the human foetus is covered is shed just before or at birth, and is succeeded by a less vigorous growth, which in the normal individual continues through life. This growth under peculiar abnormal conditions may be entirely lacking, or it may, in the case of "sports" or "freaks," attain an unusual length, owing to an excessive vitality of the follicles.

We believe all biologists agree that mammalian teeth, if not indeed the teeth of all the vertebrata, are developed in a sac or a pouch formed in part and in its earlier stages by a dipping down or invagination of the oral epithelium, which in time becomes the enamel-organ. That under this depressed epithelial layer a papilla arises from the corium beneath which the dentine is formed; the said papilla being eventually known as the dental pulp. The cementum is formed from what is known as the dental sacculus, a specialized product of the connective tissue which encloses both the enamel and dental organs, completely surrounding them.

Such being the origin of the tooth and its different tissues, are we correct in calling the mammalian tooth a "dermal appendage"? The close relationship existing between the teeth of certain vertebrates and their dermal armature or scales is best seen in the shark, dog-fish, and other elasmobranch fishes.

Of the placoid scale of the shark, Greenbaur says, "The placoid scale has the structure of the dentine, is covered with enamel, and is continued at its base into a plate formed of osseous tissue; as they agree with the teeth in structure, they may be spoken of as dermal denticles."

Some of our best-known anatomists and physiologists consider the teeth as "specialized dermal appendages," which is accepted by biologists as reasonably conclusive. Each of the various blastodermic layers gives origin to a variety of tissues. Is it therefore not reasonable to suppose that where one tissue of a certain layer is pathologically affected, others of the same layer may also be? and if in a number of instances such is shown to be the case, is it not evident that all of these tissues have the same origin?

Instances are not wanting among the various species of vertebrata, where an abnormality in one product of the epiblastic layer is accompanied by a corresponding one in another of the same layer. We know that in the order of Edentata, in which some of the individuals are without teeth and others are lacking the normal number of their class, their integuments are also very variable in character.

In the hairless dogs of China and Japan the dental system is said to be greatly reduced, as compared with others of their class who have a normal hairy covering. The manatee, or sea-cow, which is an herbivorous aquatic animal, having stiff hairs or bristles sparsely scattered over its skin, has a most peculiar and imperfect dentition, differing from any other species of mammalia.

Ascending the scale to man, we find many evidences of the same relationship between products of the epiblastic layer. In albinism the chief peculiarities are lack of coloring-matter in the skin and hair, and a pink iris. Both of these tissues are epiblastic products, and each is abnormally affected.

Within the past year the writer had the privilege of examining a family of hairless people from the interior of France, consisting of mother, daughter, and son. In each individual there was no hair upon the scalp, the fine down or lanugo usually covering the body was lacking, and the finger-nails were thick, narrow, and pointed, resembling the talons of a bird. The teeth, however, were normal in size, form, and number. Wilson mentions the case of a woman, aged thirty-three years, whose entire body was covered with thick and long hair and who had never perspired. The abnormal growth of hair was not congenital, but began at puberty and remained. The same author speaks of the nails frequently showing evidences of abnormality in connection with either absence or superabundance of hair.

Dr. E. P. Bradbury, of Boston, reports the case of a man, aged twenty-four, who was edentulous and claimed never to have erupted any teeth. This peculiarity was accompanied by an entire absence of saliva. His tongue was dry and leathery, and his speech thick. He had never been able to take solid food of any kind, but subsisted on soups and soft food.

Coming now to the correlation of the hair and teeth, let us consider cases in which an abnormality of one tissue is accompanied by abnormality in the other. In some instances deficiency of one product is accompanied by deficiency in the other, whereas in others deficiency of one is associated with redundancy of the other. Of deficiency of both structures, the most notable instance on record, and perhaps the only one of its character, is that of a man whom the writer exhibited before certain medical and dental societies in Philadelphia in 1883, a full account of which, with genealogy and verification, may be found in the *Dental Cosmos* for March, 1883.

The individual was forty-eight years of age, and had never had any teeth, either temporary or permanent. His head was nearly

bald, being only slightly covered with fine down; and while hair was present in the pubic and axillary regions, the surface of his body was entirely lacking in the surface-hairs and lanugo usually present. Owing either to the absence or suppression of the sudoriparous glands, he had never perspired. In addition to these peculiarities, he had no sense of smell and very little sense of taste, a combination of peculiarities which literally constitute him *sui generis*. He is still living and in good health, and of his six children only two (girls) show any signs of inherited abnormality, and then only in having about half the usual number of teeth.

Another case of somewhat similar character, but much less marked, is reported by M. Jarré, of Paris, a translation of which appears in the *Dental Cosmos* for June, 1892. The subject was a boy, twelve years of age, whose scalp had a scant covering of hair and whose body was entirely free from surface-hairs. His lower jaw was edentulous, and the upper jaw contained but five teeth. The finger-nails also presented an abnormal appearance, being covered with white spots and streaks.

Of the second class, in which deficiency or abnormality of the teeth or jaws is associated with excessive development of the hair, there are several notable instances on record. One of these is the well-known case of Julia Pastrana, a Spanish ballet-dancer, who appeared in Europe many years ago. The hair upon her head was dark, coarse, and strong, while upon her cheeks and chin she wore a full beard several inches long. Her dentition was normal, as testified to by both M. Magitot and Sir John Tomes, who examined her mouth, but the alveolar and overlying soft tissues were hypertrophied to such an extent that only the coronal surfaces of the teeth were visible.

Another case, mentioned by Parreidt, is that of Krao, an Indian girl seven years of age, who was exhibited in Europe some years ago. Her body was covered with a well-developed growth of hair, and her jaws presented an hypertrophied condition, her teeth being normal in number and form. A more remarkable example, in which an abnormal growth of hair was associated with a deficiency of teeth, is that of Fedor Jestichejew, the so-called dog-faced man, who has been exhibited the world over, and whom your essayist had the privilege of examining less than a year ago. In his lower jaw there are three teeth, one cuspid and two incisors. In the upper jaw there are only two cuspids; one tooth, a lower incisor, having been extracted.

When first exhibited, Fedor was about three years old, and was

accompanied by his father Audrian, who possessed the same peculiarities, but who has since died. Fedor, now a man twenty-three years of age, has his entire body covered with a fair growth of hair, while upon his face, including the nose and forehead, there is a strong growth of soft hair several inches in length. In his case also the sudoriparous glands seem to be poorly developed, for he perspires but little. Still another case of excessive hair-development, associated with a more or less defective development of the dental organs, is found in the "Burmese Hairy Family" exhibited at various times in this country and Europe. Three members of this family, the grandfather, the mother, and Moungh Phoset, the son, had their faces and bodies covered with long dark hair of a silky character. Their hands were not thus covered, but upon their foreheads, cheeks, noses, and ears the growth was excessively abundant.

That upon the forehead of Moungh Phoset was so long that it was parted in the middle and carried back and secured behind the head. The grandfather died in Ava, and was never on exhibition, but was seen and reported upon by Captain Crawford, who states that "the hair on the face, ears, and nose was eight inches long, and on the breast and shoulders four or five inches."

As to the lack of teeth in these cases, writers differ in their accounts. Crawford says the mother lacked the cuspids and molars in each jaw; a later writer speaks of her as lacking many of the teeth, but as a matter of fact, Dr. John A. Daly, of Washington, D. C., in 1888, removed no less than fifteen teeth from her jaws.

Moungh Phoset, the son, is reported as lacking many of his teeth, but this could neither be verified nor contradicted, inasmuch as the exhibitor in charge invariably refused to allow his mouth to be examined.

From the seven cases recited we see an absence or scanty covering of hair on the scalp, with entire absence of surface-hairs on the body. With this in two cases there was deformity of the nails, and in two cases partial or entire absence of sudoriparous glands, and in one case a total lack of the sense of smell and an imperfect sense of taste.

In the four cases of excessive hair development we find in two cases the normal number of teeth, with hypertrophy of the alveolar process and gum-tissues; in one case we find only six teeth *in situ*, while in the last we have no true record of the dental organs.

But there is another source from which we can derive evidence of the intimate relation of these tissues, and one seldom alluded to, that of ovarian cysts. In these aberrations of structure, which Wilson speaks of as "normal tissues abnormally placed," there are usually found hair, teeth, alveolar tissue, and sometimes nails; all products of the epiblastic and mesoblastic layers.

Professor Roswell Park says, "Such products arise from isolated portions of the epiblast or mesoblast, or both, which during the development of the embryo have been displaced and located somewhere where they do not properly belong." Such islands of tissue retain nearly all their embryonal possibilities, and, given an impetus, develop into any or all of the tissues which they might normally produce.

In view of these facts, the question naturally suggests itself, "Why should these two particular products of the epiderm so often be found to be conjointly affected?" A satisfactory answer has never been and cannot now be given, but the consideration of two points may shed some little light on the subject.

First. The development of the hair and teeth in the human embryo are more nearly contemporaneous than that of the other epidermoid tissues, the first covering of hair or lanugo being noticeable about the fourth month of foetal life, and the formation of the dentine cap or calcification occurring, according to Magitot, at the same period.

Second. The homology of the two structures is strikingly illustrated (a) in their being developed within a sac formed by the dipping down and infolding of the epithelium; (b) in their being first formed and afterwards nourished by a papilla or follicle; (c) in their limitation of growth; (d) in their being shed and replaced, once or oftener, by structures of similar character; and (e) in being so commonly found associated in dermoid cysts. We are therefore justified in concluding:

First. That where one product of the epithelial layer is abnormally affected, one or more of the other products of the same layer are also apt to be.

Second. That the two most commonly affected are the hair and the teeth.

Third. That this is shown by numerous examples throughout the vertebrata, including man.

Fourth. That the intimacy between these two products is probably due to the contemporaneousness of their inception, as well as to many points of similarity in their character and growth.

Fifth. That when thus co-ordinately affected, the manifestations are not uniform but variable.

Sixth. That this variability cannot be accounted for in the light of present knowledge.

THE PEDIGREE OF THE CENTRAL INCISOR.¹

BY DR. A. H. THOMPSON, TOPEKA, KAN.

THE condition of the upper central incisor in man is something unique, in that while all the other teeth are reduced in form and degraded in specialization, more or less, the central has not only preserved its special form and maintained the practice of its function, but has indeed advanced somewhat, being rather more highly specialized in man, as an effective cutting-instrument, than in some of the lower forms. Its form in man is similar to that of the apes, but the remainder of the teeth of the human denture have degenerated from the completeness of specialization exhibited in those forms.

The lateral incisor, while highly developed in most individuals, is frequently reduced in form and sometimes is totally absent. This is never exhibited in the central incisor, but it is the case with the cuspid. The bicuspid, molars, and lower incisors also show the effects of degenerative modification; the central incisor alone maintains a high degree of completeness and specialization in man, which fact makes a study of its genetic evolution a matter of peculiar interest.

The function of dividing and cutting food is performed by various organs throughout the animal kingdom, and even teeth for cutting are developed very low in the scale of life. The cephalopods have cutting-teeth placed on the odontophore, but these are not true incisors. The insects and crustaceans cut by means of the mandibles, and the "pinchers" of the anterior locomotive organs, which are not true teeth. The leech, nereis, and other worms have saw-like mandibles which are not properly cutting-teeth. In fact, the lowest form in which teeth with any approach to the true incisor form are found, is the sea-urchin, *Echinus*, which has five incisors arranged around a central point, in the remarkable apparatus called "Aristotle's Lantern." They are used with great force

¹ Read before the World's Columbian Dental Congress, Chicago, 1893.

to cut shells and rocks. These teeth are set in true alveoli, and are worked by powerful muscles. This is the lowest form in which true incisors are found.

In the fishes there are no incisors, properly so called, unless we consider as such the cutting-teeth of *Sargus*, etc., for the so-called teeth are ankylosed to the maxillary bones.

None of the reptiles have cutting-teeth proper; all of their teeth are pointed for seizing and holding prey. The beaks of turtles are analogous to incisors, but are not homologous with them. The same may be said of the bills and beaks of birds.

Most of the lower mammals are deficient in regard to incisors, usually having teeth on the sides of the jaws for grinding purposes only. The kangaroo has large cutting incisors, as it is an exclusive vegetable-feeder. Others of the marsupialia are variously armed, as they may be herbivorous, carnivorous, or insectivorous. In the rodents we find the central incisors developed wonderfully into the long, continuously growing implements used for cutting.

In the herbivora all of the incisors and also the canines are highly developed for cutting purposes. A curious exception is noted in the ruminants, the most of which have no incisors in the upper jaw. In the carnivorous animals the canines being excessively developed and the cutting function being usurped by the long-bladed sectorials, the incisors are much diminished. In the elephant and mastodon the central incisors are developed into long tusks, which are employed as effective digging implements and piercing weapons.

With all these, however, man has little relationship. With those that remain to be noticed we find the path of the evolution of man and the stages through which his teeth have passed to reach their present forms.

Beginning with the insectivora, the living representatives of an order which was the apparent predecessor of the quadrumana through the lemuridæ, we observe that this order presents many remarkable forms of the central incisor. In some of the moles the incisors are small, and in others like a canine with deep grooves. Owen says, "In the shrews the central is very large, with a large talon on the basal ridge, making a deep notch into which the procumbent lower central closes with a hook-like point." This talon, with the deep groove or sulcus, is sometimes reproduced in man, with the characteristic backward curve of the body of the tooth. "The typical shrew usually manifests rodent analogy by the superior size of the anterior pair of incisors in both upper and lower

jaws." But this resemblance is only in regard to general contour. "In *Sorex* the large upper incisors appear bifurcate, from the great development of the posterior talon." This talon is often repeated on the lateral incisor in man, where a lingual cingulum is not uncommon. "The hedge-hog has large centrals, sometimes with a large interspace." This is perhaps the precursor of the large interspace which is often present in man, and is so frequently a matter of heredity.

In the cheiroptera, which are closely related to the insectivora, the incisors are most variable and may be entirely absent. Some of the curious forms exhibited in the insectivorous series are passed on and reappear in the quadrumana, and occasionally in man.

In approaching the quadrumana, the highest branch of animal life related to man by collateral descent from a common ancestor, the lowest family of the order is that of the lemurs. Some of those are closely related to the insectivora as regards form, habits, and dentition.

The lemurs present considerable variation in the form of the central incisor, which advertise relationships with many groups below them and present forms which are very aberrant. Tomes says, "Most of the lemurs have upper incisors which are small and widely separated from each other." One of the lowest, and one closely related to the insectivora, is the little flying galeopithecus. Owen says, "In the colugo the two anterior incisors of the upper jaw are separated by a wide interspace. In the Philippine colugo these teeth are small with a simple bilobed crown, but in the galeopithecus the crown is expanded into a plate with three or four tubercles. . . . The lower centrals present the form of a comb produced by the deeper extension of the marginal notches into the crown. These are analogous to those on the edges of the human incisor, but the notches are more numerous and deeper." This tendency to division is recalled by the tubercles upon the edges of the incisors of man when first erupted. The longitudinal ridges which lead away from the tubercles are also suggestions of this primitive division of the crown, as an embryonic record of the history of its evolution. This was apparent to the great anatomist Owen before the day of philosophic evolution, and in our day the lesson is beautiful and striking.

In other forms of the lemurs the incisors are projecting, long, and narrow, and interdigitate with the procumbent lower incisors, which pass between them for cutting vegetable fiber.

The lowest monkeys, the platyrrhines (or wide-nosed), the

American species, are closely related to the lemurs in many respects, notably in having the third premolar. The central incisor begins to approach the final form in the higher groups, but is still somewhat aberrant. Like the lemurs, the incisors of both jaws are directed more obliquely forward, and so are less vertical than in the higher apes and in man. As these are approached, the incisors become more erect, and the form of the crown is, in consequence, less curved, for in the higher primates it is straighter and more in a line with the long axis of the root. In the platyrrhines it is still more or less of a scoop shape, resembling the lemurs. The scoop shape is often recalled in man, with the characteristic curve and thin edge.

In the catyrrhines (narrow-nosed), the Old World monkeys, the centrals are much wider and larger than the laterals, but nearer the shape found in man, even in the lower form. In some of the baboons there is more or less of a basal ridge, which is often greatly developed on the lingual face. This lingual ridge is often recalled in man, but not on the labial face.

In all the anthropomorpha the centrals are much larger than the laterals, are more vertical than in the lower forms, and assume the final shape presented in man. There is little real difference in the form of the central incisors between the higher apes and man, except in size and quality of structure and in the comparative size of the centrals and laterals. In man the extreme disproportion manifested in the apes is much reduced,—*i.e.*, the centrals are smaller and the laterals are larger.

The gibbons are the lowest of the tailless apes. Their centrals are large and strong, nearing the final human form, except that they project and are somewhat of a curved form. In the oranges the centrals are of great size, are twice the size of laterals, and have the basal ridge. This extreme size is recalled in man by those examples which we see of excessively large centrals. Tomes says these teeth are similar to those of man, but larger. In the chimpanzee the centrals are very much reduced from the size of the orang, and approach the proportions of the same teeth in man, but with a prominent basal ridge as in the orang.

In the gorilla the centrals are still nearer the final shape as in man. They are of the same form and proportions, but are larger and of coarser structure than in man, as are all of the teeth of the greatest ape. There is little real difference between the central of the higher apes and man, for it assumes the final shape long before man is reached, and must have taken on this form before the dif-

ferentiation which separated the human branch from the quadrumanous.

As showing the persistence of type and the singularity of the survival of this tooth in such perfection, we find that the central incisor of man has lost nothing in the course of the evolution of the species, and yet it is little elevated above that of the apes. In fact, the general structure of the denture of man is degraded and primitive. The central has lost nothing in the process of the destructive evolution of the species, for while the other teeth have been degraded, it has maintained its own and is really superior to the others in the retention of the perfection of its functional specialization.

REPORT OF THE COMMITTEE ON DENTAL NOMENCLATURE.¹

BY DR. G. V. BLACK.

THE task assigned to this committee, to "present a plan by which a universal system of nomenclature may be adopted by the Congress that would be acceptable to the profession of the entire world," is an exceedingly difficult one.

Accepting Webster's definition of the term, our nomenclature consists of the names which we apply to *things* or *ideas*, with their accompanying adjectives or words designating relation or location. A specified form of nomenclature requires an adjustment of phraseology to suit the forms of names used, thus giving an impress to the entire style, and in some degree to the plan of writing. The plans of expression of thought must be adjusted to the nomenclature employed, or the nomenclature must be adjusted to the plans of the expression of thought. It generally happens that in the early growth of any science, the nomenclature is in a great degree adjusted to the modes of expression of the individual writer. It is in this condition that we find dental nomenclature to-day, and it is this tendency to individual characters in writers, often good in itself, that forms one of the greatest difficulties in the way of the adoption of a definite scheme of nomenclature.

The nomenclature of any science or art is a growth, and it has been necessary to trace the steps of the growth of dental science

¹ Read before the World's Columbian Dental Congress, Chicago, 1893.

in order to understand the formation of its nomenclature, and gain a clear conception of its future tendencies. We cannot sit down and construct a nomenclature for dentists any more than we can arbitrarily prescribe the words to be used by any other class of people. Forms of speech are not readily adopted at will, but come to classes of people by processes of growth and education. Hence for a single person, or a committee selected from a class of persons, to arbitrarily prescribe the forms of speech for the class, taking their own individuality as their guide, would be wrong in theory and fact, and would only invite failure. The adoption of a definite scheme of nomenclature should be brought about slowly, and after full discussion of the scheme developed by the custom of the best writers in the particular field of science. This scheme may then be improved in the detail of its workings from point to point until finally the individual forms of the words used may be prescribed as is now done in botany, zoology, and other natural sciences.

In dentistry we may be said to have no existing rules except such as may have been developed by the customs of writers; rules not recognized by the writers themselves, unless, indeed, they have undertaken some extended study of forms of nomenclature in general, and the systematization of their own. The effort of systematization seems to have been rare among dentists, and they seem not to have given much study to the general subject of nomenclature. The studies that your reporter has been able to find generally have reference to the adoption of some individual words, or groups of words in a given language. Nowhere in dental literature do we find studies which seem to have direct reference to the systematization of dental nomenclature as a whole.

Your reporter has found no recognized rules of dental nomenclature that will serve as a basis upon which to proceed to the improvement of existing forms. We are therefore without a basis of action until such a scheme is made known and recognized in such a way as to form the basis of discussion.

The necessity for a definite system of nomenclature is becoming more and more apparent to many of the more thoughtful men. Dental literature is being rapidly built up, and within a few more years the more mature thought of the profession will be moulding into a more permanent form, or a form from which changes will be much less rapid than they have been in the past. Many have a desire to see this literature take on a form of nomenclature that will be regular, concise, and homogeneous, uniting all its parts in such a way that the acquisition of its facts will be easy to the

student, and so that writers and speakers will be able to present their thought with accuracy and be readily understood by readers and hearers.

A chief difficulty in the outstart of a work of this kind is to fix a standard of beginning. After such a standard has been established and rules have been formed, a revision is much less difficult. Fixing the standard of beginning, or the scheme of nomenclature for dentistry, involves the fixing of a basis list of names to be used in the future, the form and source of which will become the guide for the future formation of names.

The formation of both the scheme and the detail will be a difficult matter, and will require much time for several reasons. The custom followed by the older sciences in the establishment of rules of nomenclature requires that all original workers in the particular field of science be consulted, or at least that each shall have the opportunity to express his views. In our own specialty, your reporter has gathered the names of all who have written journal articles and books in the English, French, German, and Italian languages within the last two and a half years, and finds the number of persons to be two thousand eight hundred and sixty-five. The number of journal articles presented in this time, exclusive of editorials, is six thousand three hundred and fourteen. They are distributed as follows:

	Persons.	Journal Articles.	Books.
English language, America	1152	2623	51
“ “ England	519	1116	11
“ “ Canada	58	72	0
German language	610	1372	58
French language.	479	1029	39
Italian language	47	102	5
Totals	2865	6814	164

(The names obtained from other countries probably do not properly represent them, and their numbers are not given. It seems that all who have written books appear also in journal articles.)

To undertake to harmonize the views of this large body of workers is a great task, and steps should be taken to bring the matter before them for general discussion, with the view of finally adopting some fixed scheme and rules for the regulation of the selection of technical terms. What is here called the scheme involves the selection of the source of names and their form. In the nomenclature of botany and zoology the scheme requires that names shall have the Latin form,—words from the Latin language, or latinized

vernacular words. As time has passed and the use of the Latin tongue has diminished the use of the Latin, case endings have been abridged more and more until now, in the general use of the words, they are practically limited to a single form of termination.

[Dr. Black then, after detailing the history of dental nomenclature as at present existing, suggested the following scheme as a basis for work.]

The scheme, as has been said, involves the fixing of a starting-point, or the fixing of the forms and the sources of the words to be employed in dental nomenclature. This is embodied in the following:

1. The plan of nomenclature shall be the same in the several languages.

2. Use words derived from the Latin or Greek whenever such words are available, making use of the root and giving it such terminations as may be suited to the language in which it is employed.

Note.—When a word in the Latin or Greek form has come into favorable use in any language, there will be no necessity for changing it to the vernacular form.

3. When, for any purpose, a word from the Latin or Greek is not available, agree upon a word from another language and use in the same way.

4. When it is impracticable to use the same word in the several languages, select a word from each vernacular language. These should be as nearly exactly translatable as possible.

5. Adopt such general and specific rules employed in other sciences as may be adapted to dental nomenclature.

[Proceeding with the development of his subject, Dr. Black offered the following rules as suggestions:]

RULE 1.—Carious cavities shall be designated by the names of the surfaces of the teeth in which they occur.

Note.—These names are: *Labial*, for the incisors and cuspids; *Buccal*, for the bicuspid and molars; *Lingual*, for all of the teeth, discarding the word *palatal*; *Mesial* and *distal* for the proximate surfaces; *Occlusal* for the bicuspid and molars, and *incisal*, for the cutting-edges of the incisors and cuspids. (Dr. Andrieu has used the term *cuspidale*—i.e., *disto-cuspidale*—for cavities involving the edge, or cusp, of the cuspids; and also the term *buccal* for all of the teeth, instead of using *labial* for the six anterior teeth.)

RULE 2.—When two surfaces are involved, the names of the surfaces are rendered in compound words, giving the preference, first, to mesial and distal as the prefixes, and second, to occlusal. In

doing this drop the final *al* and add *o* ; thus, *disto-lingual*, *mesio-occlusal*, *occluso-buccal*, *disto-incisal*, etc.

RULE 3.—When three or more surfaces are involved, the names of the individual surfaces are rendered in a compound word ; thus, *Mesio-occlusal-distal cavity*. (See exhibit of cavity names.)

RULE 4.—Cavities in the angles of the teeth are designated by the anatomical names of the angles in which they occur ; thus, *disto-buccal angle cavity* ; *mesio-lingual angle cavity*, etc.

RULE 5.—As a class name mesial and distal cavities are called *proximate cavities* ; thus, *proximate cavities* in the *molars*.

RULE 6.—In describing the superficial extent of cavities, use no words indicating direction or position upon the teeth, except the names of the surfaces, the adverbs derived from those names, the divisions of the surfaces into thirds, or the anatomical names of parts or surface markings of the teeth ; as the lobes, cusps, angles, grooves, pits, etc.

The report, which was an exhaustive presentation of the subject, entering into a considerable exposition of details, was accompanied by an "Exhibit of the nomenclature of dental anatomy," as compiled from a number of authors in French, German, and American writers, showing the gradual development of terms. It closed with the following recommendation :

These considerations lead your reporter to recommend that a commission be formed to take up this work and complete a basis of beginning, with such rules as their information may suggest as most practicable, and bring this before the whole profession for discussion of all of its features ; making the best possible provision for its discussion in all dental journals, societies, and associations. And that they, from the information that they may in this way obtain of the wishes of the profession, revise both the basis and the rules, and finally present their report for adoption by such body as may be appointed to receive it.

CASE OF FRACTURE AND SUPPURATION AROUND THE
INCISIVE ALVEOLAR PORTION OF THE SUPERIOR
MAXILLARY BONE, AND REIMPLANTATION IN THE
SAME OF A LATERAL INCISOR EIGHT DAYS AFTER
THE INJURY.¹

BY A. C. HUGENSCHMIDT, M.D., D.D.S., PARIS, FRANCE.

In October, 1890, one Saturday afternoon a gentleman came to my consultation to present his son, a boy ten years old, with the following history:

On the preceding Monday, that is, five full days before our examination, this young boy, riding a bicyclette at a great speed, was suddenly thrown to the ground, face forward. The road was wet and very muddy. The apparent result of the injury at the time was a vertical wound of the upper lip, complete fracture of the left central incisor, almost total fracture of the right central, while the left lateral incisor had been thrown out of the mouth into the mud on the road. The father, searching later on on the spot of the accident, found the missing tooth, and after having wiped it placed it in his waistcoat pocket.

The lip was sutured by a surgeon of the neighborhood of the accident, who paid no attention to the buccal state of affairs, and the young fellow was left for several days until we saw him five days later.

As soon as he entered the office, what struck one immediately was a most penetrating and sickening odor, which had for origin the buccal cavity of the boy. On lifting the upper lip, still greatly increased in volume on account of the sustained injury, a large quantity of pus exuded from the socket of the left lateral incisor, which was absent, as well as from the margin of the gum surrounding the roots of the central incisors. These roots could be moved to such an extent that they appeared as if they would drop out of the alveoli.

Probing with an exploring needle in the alveolus of the left lateral incisor, hard, irregular fragments of bone were encountered, and we found in addition a fracture of the anterior alveolar wall. Two vertical fissures existed, one started immediately above the root of the right central incisor, while the other occupied the space between the alveolus of the left lateral incisor and canine of the

¹ Read before the Society of Stomatology of Paris.

same side. Moreover, to this fragment of bone was adherent, at its posterior surface, the root of the left central, the whole forming a unique mass quite detached from the body of the maxilla; from all these parts flowed extremely fetid pus. The first step in the treatment was to subject all these parts to a thorough disinfecting process with a solution of permanganate of potash, which was syringed through all the fissures which showed the least trace of pus, then boiled water was used to wash out the previous solution, and finally a series of injections of oxygenated water.

After having thoroughly disinfected all these parts, the young patient was sent away until the following Monday, recommending, however, to the father, that the boy should wash and bathe his mouth every half-hour during the day, alternately with a solution of bichloride of mercury 1 to 5000 and a saturated solution of boracic acid. I directed the father to apply during the night, around all the teeth, and especially in the region which had sustained the traumatism, the following preparation:

Boracic acid, \mathfrak{z} iss;
Vaseline, \mathfrak{z} i. M.

I must add that the father, before leaving me, had handed to me the lateral incisor, which he had kept in his waistcoat pocket ever since the accident. As I found, on examining the tooth, that no injury had been sustained by that organ, I determined to disinfect it as thoroughly as possible by opening the pulp chamber and by placing it in a solution of bichloride of mercury 1 to 1000.

On the Monday morning, eight days after the accident, the young man was brought back to me; the prescriptions had been carefully followed, for I tried my best to find a drop of pus in the region which two days before was absolutely saturated by it. The parts looking so well, I determined to insert the lateral incisor.

To be on the safe side, several injections of oxygenated water were made, followed by sterilized or boiled water; an injection of cocaine rendered the parts insensible. Finding the alveolus of the lateral obstructed by several spiculæ of bone, which had been detached from its anterior wall, these were removed with the engine-bur, until the cavity was free.

The lateral was then removed from the bichloride solution, the pulp cavity dried and filled with gutta-percha, and finally inserted in the alveolus. It was maintained in place by means of silk ligatures around the left canine and what remained of the right central incisor. This last, which two days before was bathed in pus,

had already become consolidated. Moreover, the ligatures were placed in such a manner as to maintain not only the reimplanted tooth in its place, but also the part of the alveolus which had been detached and fractured at the time of the fall.

The only treatment recommended during the consolidation process was buccal lotions with boric-acid solutions in daytime, and boracic vaseline at night. Three weeks later the union was complete, the bone had united, and the tooth was firm in its place. The ligatures were removed. The tooth is in place to-day, two years after the accident.

The interesting part of this case is the extensive infection existing at the time the boy presented, and the insertion, only *two days later*, in that very time, of a dental organ, which did not produce the least inflammatory reaction or disturbance.

Reports of Society Meetings.

AMERICAN ACADEMY OF DENTAL SCIENCE.

THE regular monthly meeting of the American Academy of Dental Science was held in the Boston Medical Library Association Rooms, June 7, 1893, at 7.30 P.M., President Brackett in the chair. The subject for discussion was "Orthodontia: Its present status. What are the simplest and most universally applied forms of apparatus, and most efficient retaining fixtures?"

President Brackett.—Dr. Smith has kindly consented to open the discussion.

Dr. Smith.—I beg you not to get alarmed at this display of charts and models; they are here to help illustrate some points that I could not easily present without their aid.

In order to properly discuss the question propounded by our executive committee, it seems to me necessary to divide it into parts,—

1. Orthodontia: its present status.
2. What are the simplest and most universally applied forms of apparatus?
3. The most efficient retaining devices.

Let us first look a little into the history of orthodontia. In

1541, Egenolff published a book on "Medicine for the Teeth; how to keep them Good and Sound;" and in this book he mentions that form of irregularity produced by the growing of the permanent beside the temporary teeth. And he advises the extraction of the temporary tooth and instructs the patient to press with the finger the permanent tooth, and force it into place.

This, as far as can be ascertained, is the first mention of irregularities. Fox, in 1814, and Calalan, in 1826, wrote extensively on dentistry, but little on regulating devices; and from that time until fifteen or twenty years ago slow progress was made in this important part of our specialty. In 1879, Dr. Kingsley published his work on "Oral Deformities," a book of five hundred and twenty pages, some two hundred pages of which are devoted to the irregularities of the teeth. This was followed in 1888 by the publication of the first volume, to be followed by two more, of a "Treatise on the Irregularities of the Teeth and their Correction," by Dr. J. N. Farrar. This remarkable and thorough work established forever the importance of orthodontia, and tended to make of it a specialty of dentistry.

Dr. Guilford, in 1889, by request of the National Association of Dental Faculties, published his book on Orthodontia, and in this present year has republished it with many valuable additions. This book was published as a text book for use in American dental colleges, and the fact that the author found it necessary to enlarge it, and republish it in so short a time, testifies to the rapid progress being made in the department.

In 1890, Dr. Eugene S. Talbot published his book on the irregularities of the teeth, and goes more deeply into the etiology of the question than any of his predecessors. This book is a valuable acquisition to the literature of orthodontia, and we are encouraged to expect more in the same direction from this able writer. These authors, together with Magill, Angell, Patrick, Bymer, Jackson, Shaw, and others, have given freely of their inventive genius to the construction and improvement of appliances.

Let us now consider what are the simplest and most universally applied forms of apparatus.

In answer to this part of the question, I can only say what I consider to be the simplest and with me the most universally applied forms of apparatus. And to better present my point I will refer to these models and charts. But before doing so I wish to call your attention to the fact that in bringing these models and these charts here to-night, I do not intend showing completed

cases of irregularities; that is, I do not show the models before regulating, the appliance used, and the condition after correction. I have brought parts of different cases in order to show the appliance for producing a certain movement. And first, as to moving instanding teeth.

This illustration shows an upper lateral incisor striking inside the lower incisor teeth. There is an opinion held by many that in order to bring that tooth back into place it is necessary to break the occlusion; in other words, the appliance must be so constructed that no tooth can strike in front of the tooth to be moved. I never pay any attention to the occlusion in moving a tooth. If it were true that the teeth were constantly locked together, the occlusion would have to be considered. But the fact is that we never have our teeth together except when eating, and this fact shows how unimportant this consideration is. In the case before us, therefore, we pay no attention to the articulation of the teeth, but simply adjust to the lateral incisor the necessary appliance. This case was completed in seven days, without pain or inflammation. The appliance used in such cases generally consists of what I term a Magill band. This is a ferrule similar to the band which is used with the Richmond crown, fitted to the tooth and cemented to place. To this Magill band, on the labial surface, is attached a post with a screw-thread cut around it. This post passes through a bar, which rests upon, in this case, a central incisor and a cuspid.

By the side of this post is what I term a leader. It is simply a straight piece of gold, going from the Magill band through the bar, by the side of the post, to prevent the bar from twisting as you turn the nut. On the end of the screw-post a nut is placed, and when this nut is turned up the teeth move apart and the incisor is brought forward to place. A wrench is given to the patient and the nut turned a little every day. With this appliance the pain is absolutely in the hands of the patient. It is not necessary to go into a physiological explanation of the change that takes place. I simply mention it as one method, and a positive one, of moving instanding teeth into line.

In this second case, as the lateral was very much crowded, instead of making a ferrule, a gold plate was made to fit the labial surface of the tooth, and secured to it by a ligature wound around the tooth, commencing at its neck and carried to the cutting-edge. That case was also completed in seven days without any trouble; and when the tooth was in place, there was no need of a retaining fixture. This chart shows a lateral incisor which was twisted; it

was turned a little as it was brought to place. The appliance used contained two posts and two screws. In other respects it was the same as the one first described.

Another model that I will show you is that of a second bicuspid placed inside the arch, the first bicuspid and molar being in contact. To look at that model and see the appliance, we would hardly believe that it brought the bicuspid into place without any extraction, but, nevertheless, it did. This was a case that was under the immediate control of Dr. Banfield, who used the appliance and can vouch for its results.

When outstanding teeth are to be moved to place, the occlusion need not be considered. A very simple arrangement for this purpose is the Jackson appliance, which is made of piano-wire. The wire impinges upon the tooth and forces it to place. Years ago piano-wire was mentioned by Dr. Coffin, whose name is associated with the Coffin plate. Dr. Jackson sometimes constructs the whole appliance of piano-wire, or uses it in connection with a rubber plate.

For spreading arches I will give you some of the simpler appliances. The easiest and simplest appliance is the Coffin plate. When once applied, it is sawed through the centre and the wire pulled apart, so that the spring acts upon the vulcanite and spreads the arch. The difficulty I have had with the Coffin plate is that in short teeth it is almost impossible to make the plate stay up, and in such cases I use the Shaw plate. In nearly all contracted arches you most need to spread the teeth in the anterior part of the mouth. It is very rare, indeed, to find that the arch needs spreading at the molars. The Shaw plate spreads the arch anterior to the molars more than at the molars. Here is an illustration of it. This is a vulcanite plate; here are the wings which are carried apart, and here are the jack-screws supplying a positive force. Here is a combination Shaw plate for a case in which you do not care to move the molars, or at least but very little. In this is made what I term a "movable resistance:" the power is applied on the outstanding tooth. There are many cases where the moving back of projecting teeth involves an important question of resistance. The making of a resistance of any one of the back teeth is always attended with some risks, on account of the disposition of posterior teeth to move forward. As a result, when you have finished regulating, you may find an impaired occlusion. In my experience with such cases I have found that, after my regulating was completed and the æsthetic part was satisfactory, I had tipped a molar up or down or driven a tooth into the socket, so that the articulation was injured.

In this case, the model of which I now show you, I made a resistance of a skull-cap. I first fitted Magill bands to the molars and central incisors. On the buccal surfaces of the molars were attached two lugs, through which was a hole for the passage of a gold wire, which extended in front of the incisor bands and was kept from slipping by four projections attached to these bands. A bib or bar extended across the outside of the mouth and rested on the wire before mentioned. To the bib were attached four strong elastics, which extended to and found attachment on the skull-cap already described. This was worn during the night only, and the movement gained was held during the day by an elastic, extending from a slight enlargement on the wire to the lugs on the molars. The projecting incisors were carried back in a comparatively short time, and this was accomplished without pain and with but little discomfort.

Another process of moving teeth which is much in favor with me is this. I make a vulcanite plate covering the palatine arch, to which is attached piano-wire, which fits all the teeth excepting the one I wish to move. In this way the teeth are all tied together and make a resistance that is immovable. I then wedge the tooth which I wish to move, to the desired position.

Now, for torsion of teeth, this chart represents a medium case. Here I used piano-wire in connection with a band, as here illustrated. The spring of the piano-wire turns the tooth into place. In using piano-wire, care must be taken not to have it too large.

Where teeth do not erupt as readily as they should, there are many ways of assisting the process. The simplest, as shown in this illustration, is an appliance made to impinge upon the tooth which you wish to elongate.

Where there is a projection of the lower jaw, the only method to bring it back to place is to use the skull-cap with powerful elastics. There are different theories as to how the jaw is carried back. Some hold that the ramus is bent. But I think it is accomplished by the carrying back of the condyle into the glenoid cavity.

If you have moved an outstanding tooth to line and a retaining fixture is necessary, here is an appliance that can be used. A lateral incisor has been carried to place and is retained simply by a Magill band with two prongs attached to it, one on the inside and the other on the outside. Another retaining fixture which was worn for seven months was made by striking up caps to fit over several teeth and cementing them in place. The gold was somewhat unsightly, and it was afterwards made less cumbersome with

the use of a little wire crib. In case you have spread an arch and want to hold it in place, it can be done by putting in a vulcanite plate covering the arch.

We sometimes have a deformity of the teeth caused by a deformity of the alveolus. In the case which I show you the jaw is farther down on one side than it is on the other; and I learned from the mother that the child's head was very much compressed and broken by the forceps at birth.

When one comes to study the many different appliances which are set before him for the regulation and retention of teeth, he is led to conclude with Hamilton that a man's genius is shown not so much in inventing new devices, as in choosing from the devices already invented.

President Brackett.—Gentlemen, you have all listened with much interest and profit to this discourse from one who knows practically of what he speaks. I have no doubt that Dr. Smith will be ready to make plainer anything that is not fully comprehended, and the whole subject as stated upon the card is before you for discussion.

Dr. Williams.—Dr. Smith in his discourse referred to what Dr. Jackson called the "crib." I may be able to throw a little light on the history of it. About forty years ago I saw a case of that sort on a patient who had been in Paris and who brought it over with her. It was put on by Dr. Evans, and that gave me the idea of what I called the "basket" framework as a basis for various kinds of regulating, and I have used it extensively ever since. When Dr. Jackson called my attention to the idea and supposed he invented it,—and he probably did invent it, for it sometimes happens that a person will think of something that he does not know already exists,—I wrote to him reminding him of these things, so that he might know how far back the idea could be dated. A specimen of it was made by Dr. Merrill when he graduated at the Harvard Dental School in 1871, and placed in the museum, and is probably there now.

Dr. Smith.—Dr. Payne reminds me that I have given the impression that the Shaw plate for spreading must necessarily cover the teeth. It can be adjusted merely on the lingual side when necessary for the comfort of the patient. I make a great point of not hurting patients in regulating their teeth.

Dr. Williams.—I used the ferrule that you call the "Magill band" when I was quite a youngster with Dr. Keep. That was before the phosphates were invented, and I arranged it so as to tie it on and thus keep it in place.

Dr. Clapp.—I cannot let the opportunity pass without expressing my very high appreciation of the talk that we have had to-night. The subject has been put before us in such a clear and comprehensive manner that we must be very dull indeed if we can go home without receiving much benefit from it. So far as I have used the appliances spoken of, I can testify to their efficacy.

Dr. Banfield.—It may not be generally understood that in the adjustment of some of the plates described, the teeth need separating. Will Dr. Smith please explain?

Dr. Smith.—It is necessary to put in one ligature or wedge, so as to let this thin band of No. 30 gold pass. It requires but little separation, and I prefer to separate rather than file the teeth.

Dr. Batcheller.—Dr. Smith spoke of wedging teeth forward. May I ask what he uses for large wedges?

Dr. Smith.—In some cases I use a piece of cottonwood, in others hickory. These wedges are fitted nicely, and the pain is entirely under your control, just as it is with a screw. In moving a tooth it is our object to have that movement take place with the minimum amount of pain and inflammation. As long as the change is physiological it is a healthy one, but when it becomes pathological you run the risk of a dead tooth. To-day with the modern appliances the teeth can be regulated with but little pain or discomfort to the patient.

Dr. Cook.—I am very much indebted to Dr. Smith for presenting this subject in the thorough manner in which he has. I could not help thinking, while he was speaking, that if I had received such plain instruction when at the dental school I would not have had so much difficulty in understanding this part of practice.

I use the rubber pin inserted in a conical hole for moving out a tooth. I drill the hole right through the plate with a square-pointed fissure-drill. The rubber is prepared by taking two thicknesses of rubber and putting them into a vulcanizer between two pieces of German silver. I file this vulcanite into proper shape, and insert it in the plate so that it will impinge the neck of the tooth and force it out.

For drawing the front teeth back I use a jacket-plate. A hole is made in it by vulcanizing a piece of piano-wire in its substance, then drawing the piano-wire out. A gold wire is inserted in its place and a rubber elastic attached to the gold wire; this elastic serves as the force for pulling the tooth into line.

Dr. Fillebrown.—Referring to the matter of history, I might speak of what Dr. Smith calls the "Magill band," which, by the

way, is a good name for it. The first man I ever heard mention it was Dr. Shepard, who showed it before the New England Dental Society, about 1865, long before oxyphosphate was known.

I used a Farrar appliance in a case which was recalled by Dr. Smith's speaking of the disposition of posterior teeth to move forward. An inferior cuspid was quite out of line, and I wanted to move it back. To do this I removed the first bicuspid, and made a Farrar band that enveloped the two molars and the remaining bicuspid. The cuspid was clasped with a band regulated by a screw. Those three teeth were to be used as a resistance, and I gave my patient a wrench, with the necessary instructions. But, instead of the cuspid starting a bit, the three posterior teeth came forward into the space left by the bicuspid.

I use the screw oftentimes for moving instanding teeth outward. I don't know who invented it, but I have used it as far back as 1883. A jacket-plate is made and a small screw inserted behind the tooth to be moved. This is turned up about half a turn each day. I have moved a lateral incisor out with this appliance in about a week.

I have lately used the rubber pin set in a tapering hole in a rubber plate. It slips up against the tooth and moves it out very nicely.

I have always looked favorably upon piano-wire for moving the teeth in, though I have relied principally on the jacket-plate. In using a jacket-plate one must be sure and have a perfect resistance; if you do not, the plate will be thrown out.

I was much pleased to learn the fact, which Dr. Smith has mentioned, that you can move an instanding tooth without making an opening for it. My feeling was that it would impinge so much as to make it impossible to get it into place; but I am happy to know that it does not, and will be pleased to try his method.

President Brackett.—Unless there are further remarks, it would seem appropriate to proceed to the next subject of discussion that has been put before us. The subject is, "What materials are best for temporary fillings to be retained for a minimum of three years?"

Dr. Stevens.—I would suggest that most of the permanent fillings that are put in do not last as long as that.

Dr. Fillebrown.—I should call a filling permanent if it lasted three years.

Dr. Williams.—I once put in some temporary fillings for obtunding purposes, intended to last for three months, and they

remained twenty-eight years. I then took them out and filled with gold. The cavities were between the lower incisors; they were completely protected from wear, and no subsequent caries occurred.

Dr. Banfield.—I have recently seen Weston's cement fillings that I inserted in crowns of molars eight years ago. They are now in as good condition as when inserted.

Dr. Eames.—I think it would be well to have a general understanding as to what we mean by temporary fillings. Years ago I supposed that temporary fillings were associated with certain materials, such as gutta-percha, cement, etc.; but I now understand that a gold filling may remain in a cavity a much shorter time than gutta-percha. For instance, some time ago I saw a well-preserved red gutta-percha filling which had been in the mouth for seventeen years. It was on the lingual surface of a superior central and lay well up under the gum. The filling was flush with the edges of the cavity, and needed no repair. It seems to me that a temporary filling is one which is inserted for a limited time, with the intention that some other filling will take its place in the future.

Dr. Williams.—One great trouble I have found in using temporary fillings is that they are likely to be forgotten by the patient, and are supposed to be permanent, while the original intention was to prepare the cavity for a permanent filling. I often call such fillings a dressing, and tell patients "I am putting this on as I would a bandage on a wounded finger. It is not intended to remain; you must come and have a more durable put in." I do not call this a filling, but a treatment.

President Brackett.—We come to "Incidents of Practice and Presentation of Specimens."

Dr. Allen.—I have a couple of models here which may interest the members,—two cases of hyperostosis, one of the lower jaw, and the other of the hard palate. The teeth in each case are in a perfectly healthy condition.

President Brackett.—Probably there is little tendency of the teeth to decay.

Dr. Allen.—Very little. The lower case has been progressing for twenty-five years, and there has been a slight increase in the size of the tumor during the last five years. The size of the tumor in the other case has not changed perceptibly during the past six years, in which I have had frequent opportunities for observing it.

Dr. Williams.—I saw a case of that sort on the upper right jaw

which grew so large that it impeded the gentleman's speech. It was cut out and never returned. I also had another case on the lower right jaw, and in this case the protuberance was a small one. It had existed for three or four years, and occasionally there was inflammation. I made an incision and scraped off a little piece of exfoliated bone, and then it healed up.

Dr. Clapp.—Some two or three years ago one of my patients came into the office considerably excited, and said that her husband was very much depressed and alarmed on account of having discovered a hard tumor in his mouth. She said that his physician had seen it, and rather increased the alarm. I examined the case and found a growth not more than one-half or two-thirds as large as the one Dr. Allen has shown, and I told the gentleman that he had probably carried it there for twenty years and had just discovered it. He now takes no notice of it, and it has not increased in size since that time.

There is a case which I wish to speak about which is fresh in my mind, as the patient was in my chair to-day. It is a boy thirteen or fourteen years of age, who is very healthy, and has been in at least average health all his life; but his molars, bicuspid, and incisors are simply riddled with cavities. You have all seen the same character of teeth; if there is the least defect in the enamel, on following that up you will find a large cavity beyond. This condition is in contrast with that found in the boy's brother, who is a year or two older and who has for years been very much out of health. His system has been upset some way or other, I don't know how, but his nutritive functions are all out of order, and he isn't able to go to school except a part of the time. He came to my office the other day and I examined his teeth and found them in very good condition, and during the past six or eight years I have put in on an average not more than one or two fillings a year, while his brother has teeth which look as though they had a charge of fine shot put into them.

Dr. Banfield.—I have a patient, a boy of sixteen years, whose teeth are riddled with cavities in the manner of which Dr. Clapp speaks. He has an older brother whose health is not as good, but whose teeth are in a much better condition, perhaps up to the average. I would like to ask Dr. Clapp if in his case he advised filling these teeth with gutta-percha or cement, or if he would discourage the boy in trying to save his teeth?

Dr. Clapp.—I have used nothing but cement fillings. They last very well, but an enormous number of new points of decay seem

to develop at every examination. Of course I occasionally have to refill the cavities that I have filled with cement. I certainly try to encourage the boy and not discourage him.

Dr. Smith.—Have you tested the secretions in the mouth?

Dr. Clapp.—No, I have not. It seems to me that the cause was the improper nutrition of the teeth during their formation. The decay is very marked, as though the fissures were not properly calcified when the teeth were growing.

President Brackett.—The chair would ask Dr. Clapp if he has knowledge of the dietary habits of the child,—whether it is suitably fed at suitable intervals, and is not kept constantly supplied with confectionery by an injudicious relative.

Dr. Clapp.—I have not made any inquiries. The family consists of four children, and the mother is very careful and a woman of good common sense; but so far as my experience goes in trying to get at the dietary habits of children, it is simply a farce. They will tell you almost anything.

Dr. Banfield.—Dr. Clapp says that he has used cement. I would like to ask if he thinks that wears as well as gutta-percha?

Dr. Clapp.—I have no fault to find with it in this case.

Dr. Banfield.—With the patient that I have I first tried cement, but as it dissolved badly at the cervical walls, I have put in gutta-percha for the last few years, using in most places Owens's. I find that it does better in his mouth than cement. Even gutta-percha after awhile disintegrates and needs replacing. There is not a sound tooth in the boy's mouth, and if it were not that he was faithful he would long ago have had a number of exposed pulps.

Dr. Allen.—Although it is out of the regular order, I move that we now listen to Dr. Fillebrown, who has a new method of administering ether.

Dr. Fillebrown.—The chief difficulty which we have had in etherizing patients is that we have frequently been obliged to stop work in order to re-etherize, and it takes longer to etherize than it does to do an ordinary operation. Last fall I became acquainted with Dr. Packard's method of etherizing, which consists in supplying an atmosphere with a definite amount of ether vapor in it. It occurred to me to extend this principle and make the apparatus on a large scale. I used a wash bottle, such as is made for purifying gas. You will see that there are two tubes passing through the cork of the bottle, which contains ether. Into the long tube I pass a column of air driven by the Fletcher bellows, and this stop-cock controls the amount of air which shall pass through the ether.

The vapor issues from the shorter tube, which can be of any good length, and the whole is placed in such a position that it will be near the face of the patient and still far enough off so that it will not excite inflammation. Both hands are by this method free for work. Anæsthesia can be maintained as long as you please, so that you can excise a nerve or perform staphylorrhaphy. I first experimented with the apparatus on a student who liked the fun of being anæsthetized, and I maintained the condition as long as I pleased. Twice since that I have done quite extended surgical operations in the mouth, and maintained the anæsthesia successfully. In the latter cases I induced anæsthesia by the older methods, and then maintained it with this method. In one case I found the anæsthesia so deep that I was obliged to reduce the strength of the vapor to prevent too profound effects. I believe this to be a great advance in the matter of anæsthetizing patients for operations in the mouth. The objection might be raised that the operator himself would be affected by the ether which permeates the air. I can only say I have experienced no difficulty in that direction.

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ODONTOLOGICAL SOCIETY OF PENNSYLVANIA.

THE first regular meeting of the winter series was held at No. 1228 Walnut Street, the President, Dr. E. T. Darby, in the chair.

The President stated that there was every reason to expect interesting meetings during the winter. Papers have been promised by men whose names and standing in the profession are sufficient to satisfy the members that they will be of the most interesting character.

The President urged every member to attend and bring others as often as possible. There was no reason, he said, why the Odontological Society of Pennsylvania should not take a stand and position equal to any in the country.

After reading the minutes and resolutions upon the death of Dr. Dixon, it was suggested that some account of the Dental Congress held in Chicago might be of interest.

The President stated that through some oversight no delegates had been appointed, and asked Dr. McQuillen to give his experience.

Dr. McQuillen.—The Congress was a large gathering of delegates, but the financial depression kept many at home. Many of the sections were well attended, especially the one on Operative Dentistry. The papers were interesting, but, with the exception of a paper by Dr. Emil Schreier, of Vienna, who explained his method of treating infected teeth with kalium-natrium, I did not hear anything particularly new. But there were many interesting things in the other sections. The general sessions were well attended. The clinics were unfortunate in having a crowded and stuffy room; but they were otherwise successful.

Dr. Faught requested a synopsis of the treatment advocated by Dr. Schreier.

Dr. McQuillen.—The idea of the treatment was to introduce the preparation, which, as I understand it, saponifies the putrescent pulp; and in many cases, if there is much moisture, it burns it out entirely, leaving a clean root, which is to be removed with alcohol or peroxide of hydrogen. I have tried it in three or four cases since my return, and in a few minutes have secured results that I have not been able to get before in one application,—that is, to find the root absolutely sweet after treatment. With other remedies it has taken more time; but with two or three applications of this material it seems to entirely change the condition of things. You have to be careful in applying it, for, if too large a quantity is used, it may result in an explosion. It is better to use the rubber dam and a small quantity of this agent. I think it is worth while for every one to try this preparation. I believe there is no secret in his preparation and that the S. S. White Dental Manufacturing Company made arrangements with Dr. Schreier to furnish it.

In many cases, after extracting the pulp, Dr. Schreier has been very successful in using it where he was not sure that every part had been removed. In working it down, it would have the same result there as in a putrescent pulp. After using it, you must proceed exactly as you would with an ordinary pulp-canal. Some seemed to think that after a time it would disintegrate if it were simply put in there and allowed to stay with the idea that the pulp had been made inert.

I used it about a week ago in a lateral incisor where I found a great deal of pus, the tooth having been dead for some time. I closed it up, and have not seen the patient since, but received a note saying she was comfortable. I have never been successful in immediate root-filling in these cases. In fact, I never attempt to

fill a putrescent tooth at once. With this preparation, after thoroughly cleansing the tooth, it has been sealed up for a week, making, as I think, a good test of the preparation.

The President.—In lieu of a regular paper for discussion, the subject, as announced on the programme, is, "In cases of congested pulps, should arsenical applications be made without preliminary treatment?"

Dr. Faught.—I have no facts to offer in regard to it, and never could be persuaded to do it. The principle of my practice has been to always reduce the inflammation as far as possible first, and then make the application, as I believe it to be the better practice.

Dr. Boice.—I have had some experience in making applications without preliminary treatment. About ninety per cent. are successful; the other ten per cent. make you regret that you tried the other ninety. It depends largely upon the temperament of the patient and the amount of inflammation. If a patient comes with the pulp exposed, and is going away for months, I would even then put in a partial treatment by applying morphia and leaving it in for ten minutes. Some years ago I practised immediate filling quite frequently, but do not do it now.

The President asked Dr. Boice if he had ever had any experience with Baldeck's Nerve Paste in connection with congested pulps.

Dr. Boice.—I have not. In using arsenous acid I take it for granted that it means arsenic. Any preparation that has morphia in is hardly to the question. The finer the arsenic is ground the less liable it is to cause irritation. Some of that procured at the drug-stores is entirely unfit for use. By taking it in the fingers you can feel the grains in it. I use a porcelain slab and a steel instrument to regrind it, and do so with every application I make. The preparations upon the market are generally prepared by some secret method and are not to be relied upon. Every time I have deviated from this rule I have regretted it.

Dr. Culver.—I always endeavor to allay the inflammation before making the application.

The President asked Dr. Faught how he allayed the inflammation of the pulp.

Dr. Faught.—An idea occurred to me while the other gentlemen were speaking that is, perhaps, new to the profession. It is experimental in a measure with myself, and perhaps I should say nothing about it. My ideas have been turned in this direction for the last year and a half for many reasons. You will often find that an irri-

tated pulp will exist in the mouth of a patient of a highly nervous organization,—a high tension pulse. I have been considering the pulse a great deal in dentistry; where you get a high tension condition the application of arsenous acid at that time only increases the difficulty, causing much trouble in allaying the inflammation with morphia, which is the remedy I apply. Even then I believe great good can be obtained if, in connection with the application of morphia, you place the patient upon the use of salicylate of soda. The use of this agent has especial reference to a high tension pulse,—to highly nervous organisms, to individuals undergoing what are characterized as sedentary occupations. If we look to the excretions of such persons we shall find that they are throwing off uric acid in varying quantities. According to the highest authorities the normal excretion is in proportion of one grain of uric acid to thirty-three grains of urea. This will perhaps vary one to eighteen, one to twenty, one to forty-two. If you place the patient upon the use of salicylate of soda it renders the condition of the urine alkaline. Uric acid is thrown off from the system when the urine is acid; therefore if you place them upon salicylate of soda you throw off that quantity held back when the urine is alkaline.

I merely make these statements as a matter of scientific inquiry. I am a strong believer that we have yet to explain some dental conditions by examination of the urine, and particularly under these irritative conditions in which the nervous system is being required to carry an added burden. In connection with the morphia application and the salicylate of soda, where the latter has been used continuously for seven days or more at a time,—not less than fifteen grains four times a day,—the excretion of uric acid in proportion to the urea never varies, but without it it may prove an added irritant to the system.

Dr. Bonwill.—I have but one word to say to it,—Never!

The President, asking Dr. McQuillen to take the chair, said,—

“It is undoubtedly true that it is bad treatment ordinarily to apply arsenical preparations to congested pulps. An honest confession is said to be good for the soul, and I might as well make a confession.

“The hint has been thrown out by one of the speakers that they never use any secret preparations. I must confess that I do occasionally. I experiment with it, and if it works well I continue it. When I asked if he had used Baldeck’s Nerve Paste I did so for the purpose of ascertaining whether the experience of others had been the same as mine in the use of that preparation. My attention was called to it about two years ago by an English dentist. It

was sent to me, and not knowing its composition I hesitated to use it. One day my bottle of nerve paste had crumbled up and did not seem in proper form to apply, so I took a little of this Baldeck's paste and put it on a pellet of cotton not larger than a homœopathic pill and applied it to the pulp. The patient was suffering from pulpitis. After sealing the cavity with rosin-wax the patient was sent away, with the understanding that I should see the case within forty-eight hours. The patient came back at the appointed time and stated that no pain had been suffered. I applied it time after time in the same way without knowing its preparation or its ingredients. I have used it now for two years successfully with one single exception. I have applied it indiscriminately to all cases of congested pulps and healthy pulps wherever obliged to devitalize.

"That is my confession. What it is I do not know. It may be arsenic, but I don't believe it could be anything worse than arsenic. If it is strychnine or cyanide of potassium it would not be worse than arsenic, and I do not know that I care what it is so long as it devitalizes the pulp and does no mischief."

Dr. Deane.—I do not understand Dr. Boice when he says he applies arsenic alone to the pulps, the arsenic of itself being too much of an irritant. In my practice I combine as much morphia in the cavity as I possibly can with the arsenic paste. The more there is of morphia applied to such a pulp the easier it is for the patient. I would never think of applying the pure arsenic.

Dr. Faught.—In a personal experience with Dr. Boice I never thought the doctor used any acid, as he only used the probe and inserted it into the cavity. I believe that Dr. Boice, in making the application, used such a microscopical quantity that it made his practice successful.

Dr. Boice.—The inflammation should be so under control that cold water can be injected in the tooth and the patient will not object to it, and with a probe so fine that you could put it through the cuticle without knowing it. I place it in the pulp with arsenic attached to the end. It is not the case, as Dr. Deane seemed to infer, that I apply before I get it into condition. I do not apply the arsenic until I can prick into the pulp with a probe before I use it.

Dr. McQuillen.—How do you get the tooth in that comfortable condition?

Dr. Boice.—By the use of sulphate of morphia.

Dr. McQuillen.—So that it is not responsive to heat or cold?

Dr. Boice.—Yes.

Dr. Faught.—I have experienced that at Dr. Boice's hands. This closed the discussion of the subject.

INCIDENTS OF PRACTICE.

Incidents of practice being next in order, the President stated that the Chairman of the Executive Committee suggested that a meeting be held some time to recount failures as well as successes, and suggested that such might be done at the present time.

Dr. McQuillen.—I would follow the suggestion in describing an application made to a pulp about the 5th of July. The patient came back after a proper time. In August there was still life in the tooth-pulp. She was in the office yesterday, and the fourth application was made to it, and the pulp was still quite as sensitive as it was early in July. I applied absolutely pure arsenous acid, without any morphia or anything else. There is no pain, but it is a very sensitive pulp when touched.

Dr. Long stated that nodular pulps would sometimes behave in that way; but Dr. McQuillen, in reply, said he could find no indication of any such thing.

Dr. Darby, the President, then took the floor, and said,—

“I have brought here to-night some new preparations of plastic filling-material. This was a subject that occupied a good deal of attention and elicited considerable interest at Chicago in one of the sections. I have been using for some time preparations new to me, and have brought them here, thinking they would be of interest. I speak of Poulson's cement, and one called Plombe Granite, and a cement that Dr. Tiburtius-Hirschfeld brought to me some time ago, prepared by Carl Worff, of Berlin. She says it is most used and best liked in Germany. In my hands none of the phosphate-of-zinc formulæ have ever given the satisfaction that Poulson's cement does. Most of the German cements have phosphoric acid in a crystalline form, so that you are obliged to work it before melting it. Dr. Hirschfeld told me she had discarded all in which the phosphoric acid was in solution, preferring every time the crystals or that in crystalline form. The German cements do not harden as quickly as our American cements. In proportion as there is a small percentage of water in the phosphoric solution or crystals they harden slowly; and just in proportion as they harden slowly they become durable and lasting; and as they harden quickly, in my experience, they are ephemeral in their duration; so that I have come to the conclusion that those that require the

greatest amount of work in preparing them produce the best results.

"In the mouth it takes Poulson's cement from ten to fifteen minutes to harden. It should be protected with wax, or what is still better, rosin and wax. I melt it on a spatula, and pour it on the filling after it has stood from two to five minutes. It scales after a time, but does not crumble off as wax or paraffine. I have no faith in paraffine,—it scales off as soon as it becomes wet. If you let them harden under wax and rosin for a day or so, they take a finish almost like polished ivory."

The doctor then proceeded to mix the three different preparations, and made three pellets for inspection and for the purpose of showing his mode of mixing the ingredients, using a piece of platinum, shaped into a disk about the size of a ten-cent piece, upon which, over an alcohol lamp, the substances to be melted were placed.

"The Granite cement is more granular, yet, at the same time, makes a good filling. It was sent to me by Dr. Davenport, of Paris.

"The preparations can be obtained of Dr. Poulson, of Hamburg, and cost about the same as here.

"For crown-work I use Ash & Sons' cement. It sets slowly and remains in a plastic condition for a long time."

In answer to a question as to what was a fair length of time for such fillings to last, the doctor said that he thought a filling lasting two or three years without renewing would be a good one.

Dr. Bonwill being called upon, prefaced his remarks by asking Dr. Darby how long he had used the preparation he had exhibited. Dr. Darby replied that he had used it years ago, and had laid it aside because he didn't like its action; that it was only during the last few months he had begun to use it again, and he was now more willing to take the trouble required.

Dr. Bonwill then continued, saying, "Men won't take the trouble. I cannot answer for Poulson's cement. I have been using Weston's for four or five years, but I do not like it as well as at first because I do not believe Weston manipulates it any longer; still I get good results by working it more carefully and having a certain temperature, and, everything being ready, placing it in as quickly as possible. My friend Dr. Darby will not take the trouble. By using Weston's poorer cement and being more careful in putting it in and capping it, and not only capping it, but soaking it in, he will get good results. I do not want it to stick to the surface. There is

where Dr. Darby makes a mistake in placing paraffine on the surface of the filling. It should be soaked into it. I can contour cases that I never before attempted except with such material as gold, etc.

Dr. Faught.—I cannot allow so much to be said in favor of Weston's cement without saying that I consider it the most abominable cement on the market. I did not believe it possible for Dr. Bonwill, under the most favorable circumstances, to make it so that it will stand the tests of Poulson cement.

Dr. Darby.—The pellets I made during the evening will be very hard in twenty-four hours, especially the Granite and Worff's, but the Poulson cement is reasonably hard already.

Dr. McQuillen.—There is a cement on the market to which attention has been called in the last few months, known as Richter's Harvard cement. With the exception of Poulson's, I consider it the best I have ever handled. The phosphoric acid is in a liquid form very much like glycerin, and the powder is fine and particularly well ground.

Dr. Boice.—The old Weston's cement was very sandy, and in mixing it it had a dirty color, but it would wear very well. The present cement is one of the poorest we have. I have tried to use it, but was obliged to give it up. I went to the gentleman who had charge of making it and asked him to mix some, which he proceeded to do, and in two or three minutes it was very hard, but in twenty minutes it was softer. I thought the fault might have been mine, but when the person who prepared it could not make it work satisfactorily I concluded it was the fault of the materials. Poulson's cement I have tried and given up, but will try it again.

The subject was passed, and the President urged all to attend and bring others. A paper on Hypnotism was spoken of as one of the probable future subjects.

Dr. Bonwill suggested that some time the members relate their experiences in Chicago, as to what they saw new and what not new in dentistry.

Adjourned.

Editorial.

NOMENCLATURE AS APPLIED TO DENTISTRY.

THERE seems to be an ever-increasing desire on the part of persons of restless energy to improve the English tongue, or at least to change it to their peculiar standard, and to multiply its already overburdened list of words. This in one sense may be said to be a laudable work, since all attempts in the direction of improvement may be regarded as of value. If nothing more be accomplished, these efforts arouse attention and in degree stimulate discovery.

The tendency of certain minds has been constantly in this direction for a period beyond the memory of the present generation, and yet the results are, thus far, of uncertain value even where adopted by a large body of people.

This feeling of unrest has, very naturally, communicated itself to technical nomenclature, and for a considerable period there have been periodical efforts made to improve the terms used. Dentistry being one of the youngest of the professions, this object has been more energetically pursued among its practitioners than elsewhere.

It could hardly be expected, therefore, that the recent Congress would pass without this subject being treated with more or less ability; and it has occasioned no surprise to find that several papers were read before the sections and that all of them were of value and exhibited much ingenuity. We have not had the pleasure of reading the official report in full, but the meagre abstract given leads to the conclusion that it will prove by far the ablest paper on nomenclature yet presented.

This being admitted, the question, after all, arises, What good can all this labor and intelligent thought accomplish? Beyond the mere fact that it reopens the entire subject as related to dentistry, and for a limited period may rouse minds to the consideration of the importance of better terms and more precise definitions in regard to places and conditions, it cannot advance, in the opinion of the writer, the matter one step in the direction proposed.

Language is a development, an evolution from simple roots, and, while its origin may be in a measure speculative, there are certain fixed bases of opinion, settled by philologists, that demonstrate

quite conclusively that all forced attempts to modify or create a language in whole or in part must result in failure.

From the remote periods of picture-forming to the alphabets of the present day is an uncounted lapse of time, but it is not necessary to our purpose to follow the investigations and hypotheses of philologists in their attempts to explain the gradual development from pictures to root-forms and the rise and fall of languages. It is sufficient for the present object to know that these developments have been so slow that even in those languages capable of direct observation, as in the modern tongues, changes are made so imperceptibly that it requires the trained philologist to note the varying shades of difference from one generation to another.

It is very evident, however, that in many instances words acquire very slowly new meanings entirely independent of their origin, for, as Professor W. D. Whitney (*Encyc. Brit.*), says, "When once the name is applied, it belongs to that to which it is applied, and no longer to its relatives by etymology; its origin is neglected, and its form may be gradually changed beyond recognition or its meaning so far altered that comparison with the original shall seem a joke or an absurdity."

While it is true that a composite language, such as English, is made up mainly of adopted words, there necessarily are periods of intellectual progress in which there is a demand for clearer expression, and eventually this unexpressed thought will be clothed in a word adopted or coined to suit it; but it must be remembered that the thought-form preceded and had become part of the mentality of a considerable portion of a people before the new word found a birth and final assimilation in the language. The necessity for thought expression must precede word formation.

This being true, it is impossible to conceive of a series of words being formulated by an individual or a company of individuals, and that these should transfer themselves by any known process into the living thoughts of any large body of persons. The attempts made in this direction on a large scale have always proved a failure.

The slow adoption of single words demonstrates that changes in language structure must go through a variety of imperfect forms all tending towards more precise expression of the thought as yet but crudely expressed.

All words in the various languages have had an existence originally in mental pictures, and these constitute the spirit of the language. This is rarely caught in set definitions, and hence the student fails to acquire the idiomatic force of a tongue in proportion

as he fails to absorb its spirit. It is simply the exemplification of the idea that thought precedes all word-building and that this thought must be sought for to comprehend the word.

If these propositions be true as briefly and imperfectly stated, it follows, as a natural sequence, that any attempt to build a technical structure for the adoption of a large body of persons, as the dental fraternity, must result in failure.

Improvements in expression are needed, and, it may be said, sadly needed. Dentistry has, in its short life, adopted many crude phrases and word-forms unscientific and indicative of untrained intelligence. They have been, however, representative of conditions and forms as they appeared in the earlier development of the profession, and it would seem better to bear with them as we bear with the child's prattle, until a better nomenclature can be slowly evolved. Learned treatises will not avail in this direction. The thought of the teachers of this epoch must find expression in more perfect forms, and as these slowly enter the minds of the pupils there will gradually be evolved more suitable words to replace the old, but this may require generations to accomplish.

Bibliography.

R. L. POLK & Co.'s DENTAL REGISTER OF THE UNITED STATES.

Comprising List of Dentists arranged by States, giving Post-Office Address, etc.; also list of Dentists in the United States, arranged alphabetically. Vol. I. Published by R. L. Polk & Co., Detroit, Baltimore, Chicago, 1893.

The dental profession, and especially those who needed a good directory of dentists, can be congratulated that at last one is presented worthy of confidence. When the publishers of this work announced their intention of devoting all their resources and extended experience in its production, it was the universal expectation that they would accomplish all they promised to perform. That these promises have been fulfilled is amply demonstrated in the book given to the profession.

It comprises a volume of 704 pages, and, it is needless to say, filled with important information from the first page to the last.

The labor of compiling such a book can hardly be appreciated

by those entirely unfamiliar with the methods required to secure information in this direction. It was undertaken and carried to completion with fewer errors than could have been deemed possible with a work of such magnitude.

The large cities have all been canvassed by special agents, and through the adequate machinery of this firm the balance of the country has been quite thoroughly explored.

The "pages contain the names of nearly seventeen thousand persons practising dentistry in the States and Territories. Each name is accompanied by all the information regarding place and time of graduation or registration that the publishers have been able to obtain."

"At the commencement of the list for each State and Territory is a descriptive article embodying such matters as location, boundaries, extent in miles and acres, latitude and longitude, statistics regarding climate, temperature, population, . . . dental societies, and State Boards of Dental Examiners, and the full text of all laws relating to the profession."

That such a work should be free from errors is not to be expected. This is probably not possible of attainment with any directory, and especially so with one covering such an extended territory.

We notice, under the heading of Dental Societies of Pennsylvania, that there is much confusion in the use of the names "Odontographic" and "Odontological." These two are separate organizations, yet by a curious twisting of names the officers of the Odontological Society of Pennsylvania are placed under what should have been the Odontographic, with which they have no official connection. The attention of the publishers is also called to the omission of the "American Academy of Dental Science" under the same heading in Massachusetts. Other errors have been noted, but they are of minor character, and do not lessen to any extent the great value of this production as a work of reference.

The directory should be in the hands of every dentist in the country, and will be found indispensable to all colleges, boards of examiners, and business firms in connection with the practice of dentistry.

Obituary.

DR. W. C. WARDLAW.

DR. W. C. WARDLAW died at his home, Augusta, Ga., September 3, 1893.

Very few members of the Southern wing of the dental profession were as well known as the subject of this sketch. He was constantly active, when in health, for the advancement of his chosen calling, and no labor seemed too great, or no distance too far for him to travel to meet his professional friends in the two annual conventions in which he was always an active participant,—the Southern and American Dental Associations.

His last effort, just previous to his death, was to attend the Dental Congress at Chicago, and it was the writer's painful, though gratifying, privilege to meet him there, and though he seemed feeble, yet he presented the old time interest.

Dr. Wardlaw's work has been always of a quiet character, but none the less effective for the advancement of his profession. He will be seriously missed North and South, and in both sections will be sincerely mourned.

He had been in poor health for a long time, and confined to the house for four months of that period. Subsequently to this he partially recovered his strength, and made the trip to Chicago under the hope that change of scene would be beneficial. He completed his dental studies at the Pennsylvania College of Dental Surgery, graduating from that institution in 1866.

He was elected in August to the position of Dean in the Atlanta Dental Collegè.

The immediate cause of death was congestion of the brain.

Dr. Wardlaw was twice married, and leaves eight children to mourn a good father, faithful friend, and a consistent professional man.

Domestic Correspondence.

REPLY TO DR. TAFT.

Boston, September 12, 1893.

TO THE EDITOR :

SIR,—I read a paper before the Massachusetts Dental Society, at the Annual Meeting, June 8, 1893, on "Amalgam as a Filling-Material." It was published in the INTERNATIONAL DENTAL JOURNAL of August. Dr. C. H. Taft, of Chicago, published a letter, in the September number, apparently intended to be a criticism of my paper, which demands a reply. If I failed to do this, the profession outside of the Massachusetts Dental Society would naturally be led to believe that Dr. Taft had been abused. I will not take up a great deal of your valuable space in noticing all he has written, as that which is of any account can be summed up in a few words, and when the incorrect statements are taken out, there is very little worthy of reply. Dr. Taft says in his letter, "Now, doctor, allow me to suggest that, considering the facts were all ready and waiting for a hearing, and which, partly by your own vote and influence, as is well known, were refused a hearing, such sentiments as the ones I have quoted from your paper are neither manly nor sincere." This statement is untrue, as I did not vote against having his paper read. He also says in his letter, "Before a member in good standing is again invited to read a paper before the Massachusetts Dental Society and refused a hearing because he insists upon the natural right and privilege of every man to say for himself, without assistance from others, what shall be the title of any subject upon which it is always his prerogative to write, it is to be hoped the Society will have learned a lesson in the rules which govern fair play." Dr. Taft was not invited to read this paper referred to on Amalgam by the Massachusetts Dental Society, neither did the Executive Committee invite him. This Committee met several times during the winter of 1892 and 1893 to prepare for the Annual Meeting of the Society. After completing its work, at a meeting May 15, 1893, only a little more than three weeks before the Annual Meeting, June 8, a friend of Dr. Taft asked the Executive Committee for the privilege of having a paper from Dr. Taft read before the Massachusetts Dental Society at the Annual Meeting in June. Whether this was at the request of Dr. Taft or not I am unable to say.

I will submit the following statement from the Secretary of the Executive Committee of the Massachusetts Dental Society.

TO EDWARD PAGE, M.D., D.M.D. :

DEAR DOCTOR,—In the matter of a paper written by Dr. Charles H. Taft, of Chicago, upon the subject of "Injurious Effects of Amalgam Fillings," and presented to the Executive Committee of the Massachusetts Dental Society by Dr. E. O. Kinsman for consideration, May 15, 1893, the following vote was passed :

"That, owing to the programme being completed, it is the sense of the Committee that it is inexpedient to accept the paper."

Unanimously voted.

WALDO E. BOARDMAN, D.M.D.,
Secretary of the Executive Committee
Massachusetts Dental Society.

Boston, September 11, 1893.

The paper of Dr. Taft, it will be observed, was not rejected on account of the title, as he has stated.

EDWARD PAGE, M.D., D.M.D.

[REMARKS.—Both sides of this question having now been heard, we cannot extend this controversy further. It seems to have resolved itself into a question of fact, which should be settled privately by the parties most interested.—ED.]

Notes and Comments.¹

ANTISEPTIC DENTISTRY.—In the transactions of the Illinois State Dental Society we find a very practical paper upon "Antiseptic Dentistry," by Dr. Matthew Newkirk, of Chicago. He says, in part, "A septic agent is simply that which contains the germ, the seed, the spore, the reproductive cell, of a low form of life, that with conditions favorable to itself is inimical and destructive to the substance belonging to another and higher form of life. . . . I was

¹ The assistant editor solicits contributions for this department,—new methods, new remedies and formulas, or any short practical note which may prove of value to the practitioner or student. Address 1506 Arch Street, Philadelphia.

somewhat surprised a year ago to hear a venerable and highly respected member of the dental profession antagonize the modern ideas of disinfection in this wise. As I remember, he said, 'We drink at fountains from cups which have passed from mouth to mouth and have not been disinfected; we go to hotels and use forks which have been in the mouths of we know not whom; we sit in seats in railroad cars that may be covered with germs; we ride in crowded street-cars laden with the breaths of many occupants; we do all this with comparative immunity. Why, then, should we be so extremely careful beyond ordinary washing of our dental instruments?'

"I say I was surprised, because such an argument shows plainly that his thinking had never been thorough enough to go to the core of the thing. The surgeon may open a great abscess, he may perform a laparotomy, where his hands are bathed in septic matter, and no harm follow to him, but if there be anywhere a *broken* surface, even a pin scratch, he is in imminent danger. Woe to him if with point of infected knife or needle he touches his own blood; his life may pay the forfeit, or disease may scourge him from the crown of his head to the sole of his foot.

"A young man of eighteen years, brother of one of my patients, applied to a surgeon for a slight operation on his foot, and had the misfortune to be inoculated with an infected bistoury. Abscesses followed in the lungs and elsewhere, and after suffering for months and undergoing several surgical operations, with no end of anxiety on the part of his family, he died. And all this loss and grief was suffered and borne because a certain man was ignorant, or lazy, or careless, and failed to disinfect one little instrument. If he now appreciates the truth, one would think his peace of mind would be gone forever. An experience like this would cloud the sky of a lifetime.

"That which holds true of the general surgeon is applicable to the dentist. *He uses a greater number of instruments liable to be infected in close proximity to territory favorable to infection than any other man on earth.* Every instrument which enters a carious tooth is likely to be infected by one or more of the agents or products of decay. A smooth excavator may not be, or if it is, may be readily cleansed, but a bur, with its many grooves, is certain to be, and is not easily cleansed. One of the most, if not the most dangerous instrument for infection is the bur when allowed to slip from the cavity and make a punctured wound of the soft parts."

Many cases of infection by dental instruments could be collected, and it can be truthfully said that a large number of our profession

are not to-day practising antiseptic dentistry. This carelessness in these days can be considered little less than criminal. We have been surprised to find dentists of some "standing" allowing their soiled instruments to accumulate upon their bracket or in the drawer of the cabinet, and horrified to see instruments taken from the same drawer for use without ever giving them a thorough washing.

This is a subject upon which one can afford to be unusually enthusiastic. It is one of vital importance to us as dentists and to our clients. Think, too, of a man operating with his finger-nails dirty, without washing his hands thoroughly before attending to each patient, using soiled linen, or, in cleansing the teeth of a patient, using a tooth-brush that has been used in some other mouth, as many do, because they are too indifferent or selfish to use a new one, or of a man who uses a piece of rubber dam a second time, washed or unwashed, or who fails to keep his cuspidors clean and free from odor. If he is careless in reference to these matters of personal cleanliness, he surely will be in regard to his instruments. We leave it to the reader as to what sort of man he is; surely he is not worthy the name of dentist.

CRANIA OF NATIVE HAWAIIANS.—At a recent meeting of the Academy of Natural Sciences of Philadelphia, Professor C. N. Peirce presented and described an interesting collection of ancient skulls of native Hawaiians estimated to be four hundred years old. These crania were secured through the personal efforts of Dr. J. M. Whitney, of Honolulu, an early graduate of the Pennsylvania College of Dental Surgery, who went to considerable trouble to make the collection as valuable as possible. From a letter to Dr. E. C. Kirk, and a subsequent one to Dr. Peirce, the following history is obtained.

The common people of years ago in that country were buried in the sand of the sea-shore, which is often thrown up into hills of considerable size by the trade-winds. The chiefs and men of note were laid away in caves with great secrecy and care. Tradition places these caves as burial-places of great antiquity. Many of the caves are miles from any passable road, the simple path being over the roughest and stoniest of ground, making travel very difficult.

With the bodies had been found a variety of objects, notably a quantity of *ava*, a root from which is still prepared a mild toxicant. The collection includes two skulls from the sand graves. These

are easily distinguished from the others by their bleached appearance and smaller size.

Remarks on the value of the collection and the ethnographic and anatomical peculiarities of the specimens were also made by Dr. Harrison Allen.

THE FORMS OF EDENTULOUS JAWS IN THE HUMAN SUBJECT.—In a paper before the Academy of Natural Sciences of Philadelphia, Dr. Harrison Allen endeavors to demonstrate the peculiarities of the edentulous jaws of the human subject. This is of such peculiar interest to us as dentists that I give considerable space to the subject here. Among other things, Dr. Allen says it is rare to find an edentulous arch uniformly hyperostosed or uniformly atrophied, but they exhibit indications of changes different in character from the mere loss of the alveolar process.

The lower jaw passes up in front of the upper jaw in aged individuals who have lost teeth. As a result, the doctor claimed, the attrition of the incisorial region of the lower jaw is secured against the front of the upper jaw. The result attained by such attrition he called "shearing." Shearing takes place in proportion as the upper jaw at its anterior area is beaked.

Dr. Allen claims further that the loss of the alveolar process in the incisorial region of the upper jaw causes the incisive foramen to assume an absolutely new position in relation to the line of mastication. It exhibits a disposition to lie in the dental arch instead of back of it. The attrition by shearing, however, protects the contents of the foramen from pressure.

After giving tables of examination of a number of skulls, Dr. Allen says it is a noteworthy fact that from the entire series examined, only four showed complete absence of any secondary bone adaptation consequent upon the loss of the alveolar processes, and that all of these were from civilized races,—two ancient Egyptian and two Anglo-American.

The want of harmony between the secondary adaptations probably correlates with the irregular rate at which the teeth are lost. Individual peculiarities in this regard are doubtless numerous.

He also assumed that the coarse food of savage and semi-savage people caused the jaws, even in an edentulous condition, to be used actively in the act of mastication, while the more carefully prepared food suitable to the aged of civilized people enabled the jaws to have complete rest, and hence the mechanical conditions which predetermined the localization of new structures were not active.

The speaker concluded that the series of observations strengthens the position taken that the same forces which differentiate the kind of teeth operate in fashioning the shape of the jaws, even after the loss of the teeth.

Dr. C. N. Peirce, in alluding to Dr. Allen's paper, said that some of the prominences to which attention had been drawn were, in his estimation, due to the difference in the time of the loss of the teeth. Why some maxillaries of recent or present time should show complete atrophy, while others evidenced non-absorption or secondary development, he could not explain, but believed it was associated with temperamental and nutritional conditions. The development certainly indicated a healthy recuperative power on the part of the individual. With reference to the protrusion of the lower jaw and chin, and the change in adaptation of condyle to glenoid cavity, which Dr. Allen illustrated, Dr. Peirce thought they could be explained upon the principle of use and disuse, with adaptation of structures. In infancy the angle resulting from the relation of the ramus to the body of the bone was much greater than a right angle; indeed, the ramus was but little above the same horizontal plane occupied by the body of the bone, and the jaw was capable only of vertical and antero-posterior motion, such as is essential to sucking or nursing. As the three true or permanent molars are developed, the ramus assumes its vertical position, forming almost a right angle with the body of the bone, and at the same time making lateral or horizontal movement not only possible, but essential, this motion establishing the concomitant relation between the condyles and glenoid cavities. As these permanent molars later in life are lost, the force upon the jaw in occlusion is confined to the anterior part or incisive locality, which would necessarily tend to increase the angle and protrude the chin. This occurs sometimes quite early in life and while all the anterior teeth are in position. At the same time that the vertical motion is exerting this influence, the necessity for lateral motion has ceased by the loss of the grinders. This, as Dr. Peirce says, accounts for the change in the relative position of the condyle which was so well shown by the previous speaker, and which has been necessitated by a return to the vertical and antero-posterior motion common to infancy, with the loss of the horizontal or lateral motion of maturity.

Current News.

MISSOURI STATE DENTAL ASSOCIATION.

THE Twenty-ninth Annual Meeting of the Missouri State Dental Association was held at Excelsior Springs, Mo., July 11, 12, 13, 14. The following officers were elected for the ensuing year:

President, Dr. W. E. Tucker, Springfield; First Vice-President, Dr. J. T. Fry, Moberly; Second Vice-President, Dr. Charles L. Hungerford, Kansas City; Corresponding Secretary, Dr. William Conrad, St. Louis; Recording Secretary, Dr. S. C. A. Rubey, Clinton; Treasurer, Dr. James A. Price, Weston.

Committee on Ethics.—Dr. Frank Slater, Rich Hill; Dr. W. N. Morrison, St. Louis; Dr. C. L. Hungerford, Kansas City.

Board of Censors.—Dr. E. E. Shattuck, Kansas City; Dr. H. A. Cress, Warrensburg; Dr. E. B. Crane, California.

Committee on Law.—Dr. James A. Price, Weston.

Committee on New Appliances.—Dr. J. R. Harper, St. Louis.

The next meeting of this Association will be held at Excelsior Springs, Mo., on the first Tuesday after July 4, 1894.

WILLIAM CONRAD,

Corresponding Secretary.

St. Louis, Mo.

RECENT PATENTS.

FOLLOWING is a list of recent patents, reported specially for the INTERNATIONAL DENTAL JOURNAL:

493,846. Dental Boring Apparatus. James Weber and Hugo Hempel, Berlin, Germany, assignors of one-half to Joseph Davidsohn, same place. Filed January 4, 1892. Patented in Germany, March 4, 1891.

493,893.—Dental Disk-Holder. Newton Morgan, Springfield, Mass. Filed December 19, 1892.

494,065.—Artificial Tooth-Plate. Gustav A. Juterbock, Berlin, Germany, assignor to Carl Otto Juterbock, Penge, England. Filed December 21, 1892.

497,122.—Dental Articulator. Charles F. Garretson, Knoxville, Iowa. Filed January 26, 1893.

497,370.—Brake for Dental Engines. Howard T. Eachus, St. Paul, Minn. Filed August 26, 1892.

497,723.—Dental Flask. Edwin A. Levering, Philadelphia, Pa. Filed March 6, 1893.

497,964.—Dental Hot-Air Syringe. Frank B. Norris, Helena, Montana. Filed November 8, 1892.

498,554.—Dental Broach. Olof Johanson, New York, N. Y. Filed January 21, 1893.

499,015.—Dental Furnace. James H. Downie, Detroit, Mich., assignor to the Detroit Dental Manufacturing Company, same place. Filed November 14, 1892.

499,550.—Rubber-Dam Clamp. James W. Ivory, Philadelphia, Pa. Filed March 5, 1892.

499,602.—Dental Vulcanizer. George R. Snow, Buffalo, N. Y. Filed July 8, 1891.

499,612.—Tooth-Brush. Daniel W. Tower, Grand Rapids, Mich. Filed December 21, 1892.

499,632.—Pneumatic Dental Plugger. John H. Heivly, Oil City, Pa. Filed October 3, 1892.

500,103.—Dental Chair. Daniel A. Nash, Jackson, Miss. Filed October 18, 1892.

THE WOMAN'S DENTAL ASSOCIATION OF THE UNITED STATES.

THE regular monthly meeting of the Woman's Dental Association was held October 7, 1893, at 1300 Arch Street, Philadelphia, President Mary H. Stilwell in the chair.

Professor C. N. Peirce read a paper entitled "Diagnosis."

The next meeting will be held at the same place November 4, 1893, at 7.30 P.M.

ELIZA YERKES,
Recording Secretary.

4004 CHESTNUT STREET, PHILADELPHIA.

Selections.

A SIMPLE AND EFFICIENT STRENGTHENER FOR LOWER VULCANITE DENTURES.

MR. WALTER COFFIN described a simple and easily made strengthener for inserting in vulcanite, especially adapted for inferior dentures, partial or whole, which he had used extensively with great satisfaction for many years. It consisted of a metallic strip or wire of any section, preferably of oval or half-round platinum wire, and then wound or wrapped from end to end in an open spiral with a thin gold wire about the size of which the ordinary gold springs are made, the whole soldered together with very small pieces or filings of gold solder. The platinum-wire is first bent as accurately as possible to fit the model, then wrapped and soldered. It then becomes very rigid, but still slightly elastic in all directions. Any clasps, bands, or gold backings being used may be soldered to the strengthener. When not so held in place, a length of the thin wrapping-wire may be left free at both ends of the strengthener and caught in the plaster when investing, to secure the exact position of it in the vulcanite. It is claimed for this form of strengthener that no line or plane of weakness is determined in the vulcanite; that there can be no longitudinal slip on bending; that the plate may be finished and polished right down to the gold without possibility of stripping or peeling in wear; that the strengthener occupies the whole thickness of the plate, showing slightly on both surfaces, while affording a maximum of strength.—*Transactions of the Odontological Society of Great Britain.*

INCREASE OF LEUCOCYTES IN THE BLOOD AFTER COLD BATHS.

DR. W. S. THAYER publishes a paper on this subject in the *Johns Hopkins Hospital Bulletin* for April, based on some observations made by Dr. J. S. Billings, Jr., since last November. The latter gentleman found that after baths of twenty minutes' duration given

at 70° F., blood taken from the lobe of the ear, in twenty cases of typhoid fever, showed that the average number of leucocytes before the bath was 7724 + and after the bath, 13,170 +. A further study was made of the relative proportion of the different varieties of the leucocytes to one another, and while there were constantly observed a slight diminution in the multinuclear neutrophiles and a slight increase in the uninuclear forms, there was no other difference in the proportion of varieties of leucocytes before and after the baths. The author is studying the questions of whether cases in which the bath is followed by an immediate reaction give the same results as those where there are cyanosis and coldness; of whether blood from parts that are cold and blue shows the same conditions as that taken from parts that are red and warm; of whether blood from a superficial cut with a lancet shows the same condition as that from a deep needle prick or possibly from a larger vein; of whether local applications of cold bring about the same result in a part as the general bath does; of whether there is any change in the number of red corpuscles in the cubic millimetre; and of how soon the increase in the number of leucocytes appears, and what its course is. Answers to these questions are necessary in order to determine whether this increase is general throughout the circulating blood, or whether it is only local and due to the accumulation of leucocytes in the smaller peripheral vessels. If the latter is the case, Winternitz's recent suggestion that the leucocytosis produced by cold baths exerts a destructive influence on any pathogenic organisms, and thus explains the increased "urotoxic coefficient" discovered by Roque and Weill to follow this treatment, is insufficient to explain the vaunted superiority of the cold-bath treatment. The scientific method displayed by the author in the study of this question is an example for other investigators, and we trust that he will pursue the investigation in order that he may determine the answers to the questions he has asked.—*New York Medical Journal*.

iodoform *VERSUS* ARISTOL.

UNDER this head, Dr. Richard H. Gibbons, of Scranton, gives a very interesting account of his experience with aristol. The first case in which he employed it was after an operation for the removal of a cancerous mammary gland. The entire wound approximation

was dusted with aristol. The lesion was dressed and closed for eight days, when it was found that a complete union had taken place. "Since then," says the author, "I have used aristol for all wound surfaces, exterior and cavital. In all operations about the anus and rectum I have found this remedy of great value."

Dr. Gibbons had equal success with aristol in diseased conditions of the eye, ear, nose, vagina, cervix, the female urethra, etc. He made satisfactory use of it also in suprapubic cystotomy and internal urethrotomy. The author adds that, "The powerful effects of aristol to promote rapid cicatrization" led him to employ it for special operations for the relief or cure of malignant disease of the female mammary gland. In the six cases cited the success achieved was remarkable. Concerning the value of aristol as a protective, Dr. Gibbons writes as follows: "The results which I have obtained in the use of aristol as a protection to wounds and ulcerated surfaces, and also as a stimulation to granulation, have been satisfactory to an extreme degree." Of its value in coeliotomy, he says, "In all cases of abdominal surgery I now use aristol, and find it to be the ideal protective, having had no cases of breaking down of the wound of entrance, as has happened in several cases where I have used iodoform."—*The Medical Bulletin*, March, 1893.

THE VEGETABLE MERCURY OF BRAZIL.

IN the April number of the *Annales de Dermatologie et de Syphiligraphie* there is an article by Dr. Cathelineau and Dr. Rebourgeon on this drug, founded on experiments in Professor Fournier's laboratory. It seems that in the equatorial regions of Brazil there grows a tree called by the natives *mururè*. It has not yet received its scientific name or been classified. By incisions into the bark of this tree a juice called vegetable mercury is obtained. In a work entitled *Formulario e guia medico*, published in Paris in 1884, Chernovitz stated that *mururè* juice was used in doses of a drachm, in half an ounce of water, the dose being repeated on every alternate day, according to the effects produced. It is an energetic purgative, and the natives use it especially in rheumatic affections, and above all in syphilis, whence its name. The bark is of a brick-red color. From its outer surface scales of a much deeper red are somewhat readily detached. Its inner surface is fibrous, grayish, and rather hard. The juice is a reddish liquid of rather a vinous odor and a

sweetish taste. It is syrupy and of acid reaction. After being neutralized, it was administered to a rabbit, by intravenous injection, to the extent of four cubic centimetres to the kilogramme of the animal's weight, and caused death in thirty minutes. At the necropsy the stomach and intestine presented a vinous-red color. In the left ventricle of the heart there were reddish spots here and there. The kidneys were affected in like manner. In a dog an intravenous injection of four cubic centimetres to the kilogramme gave rise to the same phenomena, and produced death in forty-five minutes. Given by the mouth to the amount of eight cubic centimetres to the kilogramme, it caused death in twenty-four hours, and the lesions found were the same as have been mentioned.

Mururè juice is only partially soluble in distilled water, but the residue is soluble in alkalinized water. The authors experimented separately with the portion that is soluble in water and with that which dissolves only in alkalinized water. When the former was used, at the necropsy the heart and kidneys were found particularly affected, while the stomach and intestine presented merely a light coloration. When the latter was employed, death took place much more tardily, but the animals had intense diarrhœa, which was not observed in the others; moreover, at the post-mortem examination it was particularly the stomach and intestine that showed an intense red coloration, while there were no visible lesions of the heart and kidneys. The authors do not seem to have employed the drug remedially.—*New York Medical Journal*, June, 1893.

INCREASED VITALITY HINDERS BACTERIA IN CARIES.

THE history of teeth is not wholly determined by the circumstances of their formation. Many observations have proved that a slow circulation pervades the dentine, maintaining a correspondingly slow process of renewal and interstitial growth. This process certainly produces at times increased density, and the presumption almost amounts to certainty that it sometimes retrogrades and causes deterioration. The evidence of this is not easy to disentangle, but it grows in distinctness. It has long been observed that the teeth rapidly decay during or immediately after some attacks of prostrating sickness and some pregnancies. The cause usually assigned has been a pathological acidity of the buccal fluids; but it is now established by researches in bacteriology that, except

at the very beginning, caries depends very little on external conditions; and therefore, if the long-recognized effects of sickness and pregnancy are facts, some cause must exist which acts within the tooth. And such a cause does exist, which is exactly in the line of our present study. Experiments made by the writer some years ago, but never published, showed that when decay occurs in fairly well-formed teeth, a zone of dentine immediately surrounding the cavity of decay has a higher specific gravity and yields more ash than a similar section from a sound side of the same tooth. This necessarily means a new deposit of lime-salts, apparently resulting from the irritation of decay. Now, such a deposit in itself is, of course, a local affair, but it implies a heightening of vital activity which must be traced back to nerve-centres. And it may well be assumed that, besides the increase of density, the increased vitality of the dentine hinders, *pro tanto*, the ravages of the bacteria. If, then, this be the normal check upon decay, anything which so cripples the nerve-centres as to prevent this opposition leaves the tooth defenceless to its enemies, and destruction is far more rapid. Now, to this failure of normal inhibition rather than to any local cause the quick decay accompanying disease and pregnancy must be ascribed.—J. SMITH DODGE, M.D., D.D.S., in *Journal American Medical Association*.

AN ALLEGED DEATH FROM EUCALYPTUS OIL.

An inquest was held at New Norfolk on Saturday, March 4, on the body of Victor Bradshaw, aged nine years and ten months, son of Mr. A. Bradshaw, of Back River. From the evidence it appeared that the deceased had been taking eucalyptus oil as a cure for cold, from which he and other members of the family were suffering. Finding that he was seriously ill, Dr. Neale was sent for, death ensuing shortly after the doctor's arrival. A post-mortem examination having been held, it was found that deceased must have taken one-half ounce of oil, the dose for an adult being five drops. The verdict of the jury was that death had been caused by an overdose of eucalyptus oil, with a rider that the word "poison" should be added to labels following the words "dose, one to five drops."—*The Australian Journal of Pharmacy*.

THE International Dental Journal.

VOL. XIV.

DECEMBER, 1893.

No. 12.

Original Communications.¹

A CONTRIBUTION TO THE STUDY OF THE DEVELOPMENT OF THE ENAMEL.²

BY R. R. ANDREWS, A.M., D.D.S., CAMBRIDGE, MASS.

IN a paper presented before the Dental Section of the Tenth International Medical Congress at Berlin in 1890, I gave the result of my investigation on the formation of enamel up to that time. Since then my study leads me to believe that there exists in the young developing enamel something that has the appearance of fibres, guiding and sustaining the globules that are excreted from the enamel-cells which are to form the future enamel-rods, upholding and supporting them. An eminent English writer seems to imply that the study of dentine is the more difficult of the two, but my experience teaches me that the study of enamel development and calcification presents vastly greater difficulties. John and Charles Tomes were of the opinion that the enamel was formed by actual conversion of the enamel-cell; that the proximal end underwent some chemical change preparatory to its calcification, and subsequently calcified; that the calcification did not go on uniformly throughout the whole thickness, but from its outer surface towards

¹ The editor and publishers are not responsible for the views of authors of papers published in this department, nor for any claim to novelty, or otherwise, that may be made by them. No papers will be received for this department that have appeared in any other journal published in the country.

² Lecture delivered before the World's Columbian Dental Congress, Chicago, August, 1893.

its interior, the centre portion calcifying later than the external; that as this calcification proceeded it also united the contiguous cells to each other. Dr. J. L. Williams believes that the enamel-organ is glandular in its nature, and a true secreting organ. Appearances teach him that the ameloblasts are the active agents in depositing lime-salts on the periphery of the dentine. In teasing enamel-cells from partially formed enamel, he finds that they show a fibre running out from that end of the cell. He tells us that the enamel is probably formed, not by a change of the enamel-cells into a glue-yielding basis-substance, which afterwards becomes infiltrated with lime-salts, but by a process of secretion and deposition. As the formation of enamel progresses, these cells recede, leaving within the formed enamel what appears to be a fibre of living matter in the centre of the enamel-prism.

Professor W. X. Sudduth, in an article in the "American System of Dentistry," is of the opinion that during the period of amelification there is no conversion of living tissue into enamel, but that the enamel is produced by a process of excretion. He finds that at first the salts of calcium are stored up in the meshes of the stellate reticulum of the enamel-organ, furnishing material for the first-formed layer of enamel. After this, the enamel-organ having disappeared from over this calcified layer, the salts of calcium are furnished by a rich plexus of capillary vessels, which are now found to be in direct communication with the enamel-cells. He believes that the fibrils, which have been called "Tomes's processes," are nothing more than semi-calcified material that adheres to the enamel-cells, giving the appearance of a fibril or a prolongation of the cells themselves. He considers them as being mechanically made, for they do not always appear, but depend upon a certain condition of the calcific material. He had succeeded in demonstrating them in the enamel-cells of pigs' teeth, where they showed very plainly, indeed, being nearly or quite as long as the cells themselves, and several times longer than the enamel was thick. As a rule, he finds that the enamel-cells separate from the forming enamel so as to leave a comparatively smooth line. He has never been able to demonstrate processes that would lead him to infer the least analogy between them and the fibrilla of odontoblasts. He seems at a loss how to regard the cells of the stratum intermedium, and says, "Just what their significance is I am unable to state positively. I am led to believe that they supply the places made by the increase in the circumference of the enamel, and account for the short prisms seen in ground sections of the enamel. Their office is to develop

ameloblasts to supply the places of those which are carried up with the growing tooth." To him the enamel is simply a coat of mail supplied by nature to protect the dentine.

Kölliker believes that the process of calcification is one of secretion. The "Tomes processes" he considered as being fragments of the hardened secretion, which are still clinging to the parent cell. Schwann believed that the enamel-cell was constantly increasing at the end next the enamel, and that the new growth or younger part is calcified as soon as it is formed. E. Klein says that the enamel is formed by the enamel-cells in the same manner as the dentine from the odontoblasts,—that is, the distal extremity of the cells next the dentine elongates, and this increment is directly converted into enamel.

I wish to repeat what I have already said before, that the continual sheet of tissue that can be raised from young developing enamel is not a membrane, and I think most of the more recent authorities agree with me. Charles Tomes gives us to understand that it is something produced solely by the destructive action of acids; but this I am quite sure will be found to be a mistake. Mr. Mummery has shown that this layer exists in teeth which have not been subjected to the use of acids. It is only that part of the enamel first formed that is not wholly calcified. The enamel cells that have been properly prepared and not shrunken will be seen filled with minute globules, highly refractive, and supplied, when the enamel is first formed, from the meshes of the stellate reticulum rich in lime-salts at this time.

When the stellate reticulum is absorbed, as it is just after calcification commences, the lime is supplied by a rich capillary network in contact with the enamel-cells. The authorities who speak of granules of lime have described them as seen in the shrunken cells in the tissue as it is usually prepared. They are really globular, though minute. If, just as calcification commences, we place a few drops of dilute nitric acid on the slide near the edge of the cover glass, it will, by capillary attraction, run under, and these refractive granular bodies in the stellate reticulum will disappear, as will those that are in the enamel-cells themselves. Large numbers of small bubbles will accumulate, and force themselves out from under the cover glass. This would seem a positive demonstration of the presence in the stellate reticulum and enamel-cells of carbonate of lime just previous to commencing calcification.

I am convinced that these minute, refractive bodies are calcospherites, that are taken in by the active enamel-cells, and excreted

from them where, by coalescing they form larger globules, and these form the rods. You will pardon me here if I quote briefly from my former paper on this subject. In teasing off portions of active enamel-cells from enamel forming, I have found the surface of the dentine on which it is being formed covered with layers of globules that have been deposited there by the enamel-cells. These given out from the cell continually form, by coalescing, larger globules, and these become the enamel-rods. One rod is separated from another by what appears to be a protoplasmic substance. This substance in many of my sections projected out beyond the line of calcification, and appeared as though it was a process or a fibre; of this I shall speak farther on.

Many of my sections of forming enamel were purposely cut extremely thin, that I might study a single thickness of the layer of the cells, and these specimens were not stained; therefore some of them do not show as clearly in the photo-micrographs as I could wish. Yet I think I shall be able to demonstrate the points of which I speak. Others of these photographs will illustrate it almost as a diagram. Some little time after finishing my former paper on "Enamel, its Development and Calcification," I read it to Professor E. L. Mark, of the Biological Department of Harvard University. He stated that I had found and demonstrated new points about the enamel that a German investigator had recently described; that both papers gave similar views. At my request he translated the paper from the German journal in which it was published. Its title was "On the First Processes of the Deposition of the Enamel," by Dr. Graf Spee. The description he gave of this process was so nearly like my own, that I read it with considerable surprise.

I did not know that any one had described the enamel-rod as being formed by minute globules coming through the cell. But he had seen these minute and highly refractive globules in the body of the cell, and says that when the tissue is properly prepared—and he lays great stress on this point—they are always to be found there at the time of the formation of the enamel. Their entire absence at earlier stages is an indication that these globules are an enamel substance. He gives to them the name "enamel-drops," and says he saw these "enamel-drops," when enamel is to be formed, appear only in the half of the enamel-cells which rests on the dentine; afterwards farther up in the cell, but not quite up to the region of its nucleus. Many of them were so small as to be scarcely measurable, and they are always spherical. Great numbers of them are

collected at the periphery, and appear here either to be completely merged or fused together. The lower part of the cell contains the larger "enamel-drops," which merge without sharp boundaries into the substance of the enamel-rods. This then appears as a part of the enamel-cell, in which the originally isolated "enamel-drops" have run together into a continuous mass, and the growth of the enamel rod once begun, appears to take place by the addition of new "enamel-drops." Dr. Spee's "enamel-drops" were really what I described as minute calco-spherites, which, merging together, had formed larger globules, of a substance which I believe to be calceoglobulin.

Perhaps the most important contribution to the literature of dental histology during the last decade is a paper entitled, "Some Points in the Structure and Development of Dentine," by J. Howard Mummery, M.R.C.S., L.D.S., of London. This paper was read before the Royal Society, March 5, 1891. Appearances noted and demonstrated by Mr. Mummery in this paper recalled to my mind similar appearances which I had seen in the developing enamel, appearances that I could not then explain, that I did not understand. As some of his results will be of interest to us while considering my subject, I shall try and give a brief idea of them. He noted the appearance of connective-tissue fibres or bundles of fibres in advance of the main line of calcification, whose high refractive index suggested their partial calcification, these processes being continuous from the formed dentine to the general connective tissue of the pulp. He found in a young developing tooth a distinct reticulum of fine fibres passing between and enveloping the odontoblasts. By a careful focusing, he saw these fibres gathered into bundles and incorporated with the matrix-substance of the dentine, out of which they seemed to spring. The origin of these fibres would seem to be from connective-tissue cells which are found everywhere in the pulp next the odontoblastic layer, and also, as he demonstrates, between the odontoblasts themselves.

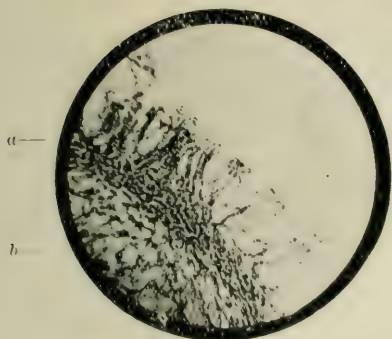
He continues: "We can no longer look upon the matrix of dentine as being a homogeneous substance, but must regard it as composed of a net-work of fine fibres of connective tissue, modified by calcification, and, where that process is complete, entirely hidden by densely-deposited lime-salts." His investigation as to the occurrence of this tissue suggests this view, that these fibres are the scaffolding on which the tooth-matrix is built up; that they are incorporated in the matrix of the dentine, and form really the basis of its substance. Mr. Mummery's article is convincing and admirably

demonstrated. His investigation was carried on after the process of Dr. L. A. Weil, of Munich, which consists of first fixing the soft parts of developing tooth in a saturated solution of corrosive sublimate in water. When fixed, the sublimate is removed by washing, and the specimen pressed through successive strengths of alcohol to absolute alcohol, then into chloroform, to which are gradually added fragments of desiccated Canada balsam, until a very thick solution of the balsam is produced. It is then allowed to penetrate and become hardened by keeping in a warm temperature. After the balsam is hard the specimen is removed, cut with a fine, sharp saw under water, as there has been no decalcification, and the sections thus cut are ground down first on a lathe with corundum and afterwards on a fine stone with water under the finger. Sections are then mounted in Canada balsam.

I have tried this process without any success on the developing enamel. The tissue at this time is too delicate to stand this treatment, and results in my hands have been failures—perhaps from a want of more practice in this method. But I do not believe it can be used with success when the tissues are so delicate. Certainly here the investigation of enamel is more difficult than that of dentine. The method is admirable for investigating fully-formed structures, as it shows the organic tissues in undisturbed relation to the calcified tissues. Appearances of calcified fibres projecting beyond the line of calcification I have already seen in young forming enamel, and I commenced a series of investigations to see if I could find out what these appearances indicated.

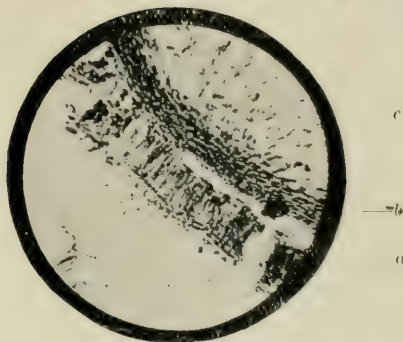
I commenced by trying to tease apart enamel-cells; after some little experimenting I am quite sure I found evidence that processes from the cells of the stratum intermedium of the enamel-organ pass down through and among the ameloblasts to the forming enamel beneath. (See Fig. 1.) And I judge that these are the processes which Mr. Tomes saw and described as processes connecting the enamel-cells with the cells of the stratum intermedium. I then commenced a series of experiments, trying to separate slightly the layer of enamel-cells from the stratum intermedium. The parted edges had the appearance of broken processes, and in several specimens there are processes crossing from the enamel-cells to the stratum intermedium. I shall try to demonstrate this appearance to you, although I confess I have a difficult task; the teased and pressed tissue and the different depths of the tissue make the matter a difficult one. I think I shall be able to indicate what I mean by my photo-micrographs. (See Fig. 2.)

FIG. 1.



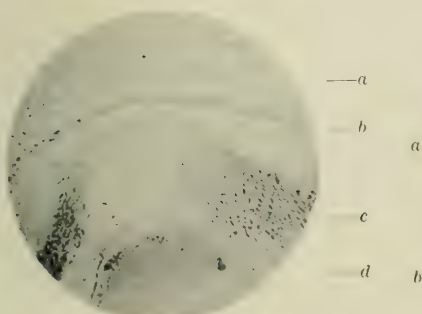
- a. Enamel cells—teased out, showing an appearance of fibres.
- b. Stellate of reticulum of enamel organ.
About 1000 diameters.

FIG. 2.



- a. Enamel cells—teased out to show an appearance of fibres between the cells and the stratum intermedium.
- b. Stratum Intermedium.
- c. Stellate reticulum of enamel organ.
About 1000 diameters.

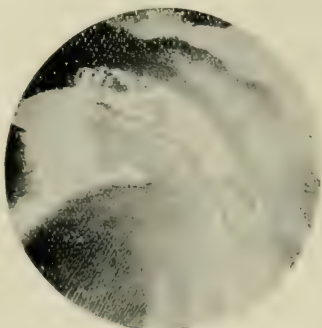
FIG. 3.



- a. Layer of enamel cells.
- b. The thin layer, first forming enamel.
- c. Forming enamel, showing fibres.
- d. Dentine.

About 1000 diameters.

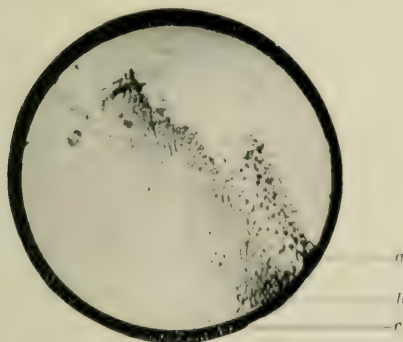
FIG. 4.



- a. Forming enamel, showing fibres.
- b. Dentine.

About 1000 diameters.

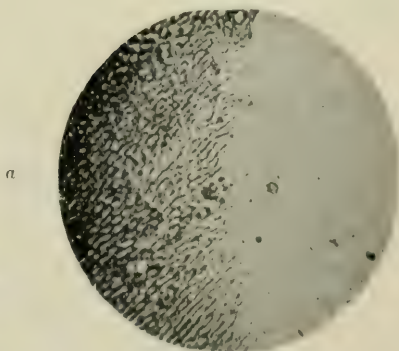
FIG. 5.



- a. Younger layer of enamel.
- b. Formed enamel.
- c. Dentine.

About 1000 diameters.

FIG. 6.



- a. Enamel forming—shown as pulled away from the enamel cells.

About 1000 diameters.

A longitudinal section of a human tooth at birth, just after the process of calcification in the enamel has commenced, will show, between the enamel-cells and the formed enamel, a thin layer which has been called by earlier investigators the *membrana performativa*. (See Fig. 3, *b*.) It was misunderstood then; it is not a membrane. It is the latest deposition of enamel from the enamel-cells, composed of globules or masses of calco-globulin; and around these globules there seems to be a fibrous net-work. Connecting with this fibrous net-work and running to the formed enamel beneath, we find innumerable thread-like processes, appearing like fibres. (Fig. 3.)

In several of my specimens this shows with great distinctness. (See Fig. 4, *a*.) There are indications of fibres which have been broken on the upper portion of this thin layer which appear as though they had been broken off in the separation of the layer from the enamel cells. In a longitudinal section of the tooth of a calf at birth, where the recently-formed layer of enamel is still in contact with the fully-calcified enamel, I have succeeded in teasing off this younger portion and exposing to view what appear to be fibrils standing out from the surface. (See Fig. 5.) These have apparently been drawn out from the only partially calcified new tissue.

In another longitudinal section from calf at birth are to be seen, on that part of the enamel broken away from the enamel-cells, processes standing out like so many coarse threads. (See Fig. 6.) They appear so large that it is probable they have been enlarged either by the action of reagents or by calcific matter clinging to a fibre, if one is there; and they are undoubtedly partially calcified. They are very much coarser than the fine fibrils which I saw between the enamel-cells. Deeper within, these processes are seen to surround the globules or masses which have been deposited by the enamel-cells, and which are forming the rods.

In another section from tooth of calf, the younger layer of forming enamel shows a net-work of fibres, of which I have already spoken. They are surrounding the recent deposition of globules. It is only in this layer that I have been able to demonstrate this appearance. I have not been able to see this net-work in more fully-formed enamel, but a distinct net-work is always visible in that layer first deposited.

In regard to the processes of the cell, Tomes first describes them, and says they are due to the manner in which the cell calcifies. In his illustrations they are shown as coming from the base of the cell, from the centre, and from the extreme edge. Sudduth believes that

they have nothing whatever to do with the cell, as being mechanically made. He pictures them as coming from the base of the cell, from both sides of it, and from between the cells.

Williams, as I have already quoted, states, "As the formation of enamel progresses, these (enamel) cells recede, leaving within the formed enamel what appears to be a fibre of living matter." We have here, you see, a variety of opinions from excellent observers. My investigations lead me to believe that these processes may have their origin among the cells of the stratum intermedium; that they pass either within or between the enamel-cells, and thus on, to form a fibrous sub-structure, among which are deposited the globules which are to form the future enamel rods.

When the calcification of the rod is complete, the lime-salts have been so densely deposited as to entirely obscure the appearance of any fibre. The stratum intermedium, in which, as I have stated, I have reason to believe these processes originate, has been thought by more than one observer to be a species of connective tissue. Of this fact I am not certain. But it is certain that, after calcification commences, the connective tissue of the jaw is in direct contact with the cells of the stratum intermedium, and the cells from this stratum must be and are recruited from the connective tissue of the parts.

Tomes, who has done much in describing human and comparative dental anatomy, has shown us that fibrils exist in the enamel of the kangaroo and in the Sargus, or sheep's-head fish. In this fish the enamel is penetrated by a system of what he describes as tubes, which are not continued out of, or derived from, the dentine, but belong to the enamel itself. They give off numerous branches. This peculiar appearance led Kölliker to believe it was not true enamel, but Tomes proves that, being developed from an enamel-organ homologous with and exactly like that of amphibia and reptiles, the tissue must certainly be regarded as unquestionably enamel.

To sum up my conclusions: I am led to believe that there probably exists in developing enamel, as has already been found in developing bone and dentine, a fibrous sub-structure on and between which the enamel is deposited. After the enamel is wholly formed, its existence seems to be wholly blotted out in the dense calcification of the tissue. In sections of wholly-formed enamel I have never been able to trace it, although I have tried the methods of those who claim to have seen it. In regard to the beaded protoplasmic reticulum of living matter in formed enamel, I have never

been able to find it. I believe with Klein, that it is improbable that nucleated protoplasmic masses are contained in the interstitial substance of the enamel of a fully-formed tooth. I wish, in closing, to acknowledge my indebtedness to Professor George A. Bates, of the Boston Dental School, for the use of specimens of sections of human teeth at the time of birth, which he had prepared, and from which several of my best photo-micrographs have been made.

DENTAL DIAGNOSIS.¹

BY DR. C. N. PEIRCE.

IN speaking upon dental diagnosis, let us first endeavor to define what it should embrace. The successful study of any subject necessitates its division or arrangement, as far as possible, into branches. In this, one of these should comprise the laws and facts common to individual affections,—that is, whether due to inherent or external influences, and, indeed, everything that can be gathered relating to their causes; and a second should embrace the method of detection and a full recognition of the nature of the affection, its expression, and its influence.

Following in this line or with this purpose in view, you can readily see how diagnosis becomes partly a science and partly an art. A science, because it involves a knowledge of the evolution of the structures and the laws governing their disintegration as well as their integration. An art, because it demands a delicacy of touch, an accuracy of observation, and a quickness of perception; qualities which can only be gained by experience, by practice, and by thorough mental training. Hence I cannot presume to talk intelligently upon this important phase of our daily practice without making first an inquiry regarding the natural forces which have been instrumental in establishing the shapes and density, as well as the development, of the structures with which we have to deal.

The great naturalist Linnaeus wrote as early as 1784 that the stony rocks are not primeval, but the daughters of time, and since then geologists, astronomers, zoologists, and scientific men generally have declared that not only this our earth, but all growths and things thereon, together with the planets and stars, have only come

¹ Read before the Woman's Dental Association of the United States, October 7, 1893.

into their present liquid and solid condition after immense intervals of time, and hence very gradually. They believe that each and all existing forms are wholly the result of surrounding conditions and forces which were favorable to their development. That slowly and very gradually have the animal as well as the vegetable growths been evolved from pre-existing waters and rocks. That all forms and structures at the present time existing have only been produced when the environment favoring such growths enabled the forces of nature to call them forth.

To impress upon you the influence of environment, I have but to remind you of the facts you have gained from your previous studies in your chemical and physiological laboratories; the combination of the same materials under different conditions and in different proportions producing such varied results, and how differently the same degrees of heat act on various liquids and solids. Our physiologists will tell us that organic structures as well as inorganic are sensitive to varying influences, and give under different circumstances just as great an array of modified and dissimilar results. That every manifestation of force by a muscle or a nerve is the result of a transformation of the structure or of its substance, varying with the effort; that every conception, every mental affection, every sensation, is followed or accompanied by a change of the composition of the substance of the brain. That sensations and movements are simple or complex in proportion as the structures themselves are homogeneous or heterogeneous, and that the morbid or abnormal conditions manifested in these structures vary in the same ratio.

Now, what we first need to appreciate is that the dental structures are in their origin and evolution not in the least different from all other tissues; that they have come into their present pathological as well as physiological condition by a long and slow process and in response to natural forces; that their history, if written out, would be like unto that of all other tissues or organs. When we recognize visible signs of dental decay or premature loss, so patent to our eyes and sense of touch, we want to appreciate the fact that this superficial condition, which is a disturbance of what was but a short time before apparently normal tissue, as recognized by our unassisted senses, is not the complete revelation, it is but the local expression of some near or remote cause, for the discovery of which science has lent and is lending us its aid. The true surgeon or physician is not content with the treatment of superficial manifestations, but with chemical, microscopical, and physiological knowl-

edge, he, if possible, goes beyond the surface, to see if there is not some lurking vice—nutritive or constitutional—underlying the local expression. In like manner must the educated dental specialist look for some departure from normality at some remote time and in remote structures or organs which have induced constitutional predispositions or local affections. As an illustration. A change has taken place. A change of what? The result is observed, the lesion described with definiteness and accuracy. We give its location, the structures involved, and appreciate the probable complications which would beset us in our efforts at arrest and restoration. It may be, or we will assume it is, a simple case of dental decay, with limited disintegration of the mesial or masticating surface, or both combined, of a molar or bicuspid; we go so far as to state that this disintegration is preceded by death of the part, and that the solvent was an acid, the source of this agent being the saliva, and that its virulence was augmented by the presence of certain micro-organisms. What then? Have we answered the query as to the cause of the anomaly? Probably not. The symptoms of the malady we have recognized, as well as some of the sequences, but what do we know of the relations of these sequences to the diseased or to the normal tissues, or of the predispositions or of the cause of the predispositions? Let us remember that the study of any phenomena, whether normal or abnormal, only reaches its final and legitimate conclusion when we have traced it back to its first departure, with a history of the circumstances which were present and could exert a modifying influence.

If structural predispositions are suggested or recognized, did these have their origin in constitutional or local peculiarities? If the former, did they arise from family, society, or racial methods or customs? Certainly the study of any abnormal expression should not be ended until the influence of all these previous or preceding conditions has been, as far as possible, ascertained.

We see what a gauntlet every organ and tissue has to run, subjected to modifications from use or disuse, environment, nutrition, and whim, from or through a line of ancestors not equalled in age by civilization, or, indeed, by the age of man himself. Every change in the actions of life must have had its influence on the growth and development of every organ and structure. While there is complete correspondence or harmony between structure and function modifications would be at their minimum, but when upon organs and tissues a continued strain has been brought, or the reverse of this, a diminution of force, then there must result as

a natural consequence either atrophy, disintegration, or integration. Rest or equilibrium in life we know is almost an imaginary factor. The ideally perfect state must be wholly a fancy. Life with an organism whose inherent force is so exactly adjusted to external influences as to remain immobile and impassive under varying states would be a crystallized being, motionless and emotionless.

The only living existence of which we are cognizant is in a perpetual struggle, and its greatest gain is that advantage which a temporary harmonious adjustment gives the inherent over the exterior forces, and with this such opportunity as enables the unit to repair its losses or produce another unit, to take up the struggle and perpetuate itself through an infinite series, and so reap the physiological profit which is to be gained by inheritance or transmission.

Through all these successive complications we do have established types and typical characteristics, abnormal as well as normal, and these are sufficiently permanent and uniform in character to be similarly modified by like influences, inherent as well as exterior. As there is, then, a certain consecutiveness in the order of development, so must there be disease occurring and even recurring in conformity with the fixedness of types and similarity of conditions.

Every abnormal or pathological condition we now see rests on three factors: first, the primary injury representing the incident or external force; second, the susceptibility of the part, which is the representative of the internal or inherent force; and, third, the pathological effect, which is the result. In pathological studies neither of these factors can be ignored.

It is recognized that susceptibility to disease has its origin in defects of development; also that these defects are not peculiar to the individual, but occur in greater or less degree in the same form throughout a large portion of civilized people; this being the case, we must assume that a similarity in development, with a similarity in environment, must produce a like susceptibility and a remarkable sameness in the expression, which we recognize as disease. But we must remember that susceptibility to disease is ever changing or shifting with the stage of development, or with the age of the patient; the weak points differ at different periods of life, and this is especially true with the dental organs.

The dental practitioner who undertakes to relieve disease, or the abnormal conditions for which advice or attention has been solicited, without understanding or at all appreciating the conditions which

have induced the abnormality, is groping in the dark; and while success may at times favor the methods adopted in the end, it falls far short in satisfaction of a practice based upon a knowledge of the cause, with an intelligent reason for each step in the operation. In utter disregard, however, of all our studies and desires, we meet with most serious obstacles, from the fact that frequently several lesions coexist; disease is very often a complex state, and when one portion of the economy gets out of order others are apt to follow; hence it follows that a diagnostician, to be reliable, must be an anatomist, so as to pronounce on the seat of the malady; must be a physiologist, so as to appreciate the aberration of functions; and, above all, must be a pathologist, so as to understand the antagonism between diseases, the frequency with which they coexist, their numerous and varied expressions, and the influence of remedial agents upon them.

As an illustration of the influence of force, and also of the possible retrogression or degeneration of structures from its absence or withdrawal, let us examine the inferior maxilla, its attachment, power, and its movements. As you are all aware, it is simply a lever, and one of the third class, where power is between the fulcrum and the weight; the condylar attachment with the glenoid cavity being the fulcrum; the muscles—masseter, buccinator, and temporal—being the power applied to the anterior part of the ramus, or its locality just anterior to the fulcrum, and the jaw anterior being the weight. The power of these muscles as exerted on the movable inferior dental arch against the fixed superior arch is beautifully shown in its varied influences, the differences in the sizes of the opposing surfaces representing the greater or lesser forces exerted upon the molars, bicuspid, and incisors, as they are near or remote from the point of applied power. Assuming that the presence of the enamel, as well as its density, is the result of the resistance offered by the food of the ancestral animal and man, and of the necessary power for the crushing and trituration or comminution of that aliment, then the withdrawal or lessening of that force by the change of diet must in time not only lessen the capacity of the muscles for exerting that maximum power, but would also lessen the capacity of the structures to withstand the greater resistance which had been necessary in the preparation of the tougher and harder nutriment. So here we have an illustration of how the diminution of force can induce a predisposition to atrophy or disintegration, if not the actual result itself.

Let me next give an illustration of the coexistence of diseases

which may cloud or embarrass our diagnosis and complicate our treatment. I mention now a case with which I have been confronted on more than one occasion. The patient has an impacted inferior third molar with superficial ulceration of overlying soft tissue, as well as accompanying degenerative processes going on around the roots from the inflammatory condition; concomitant with this local condition severe gastric trouble from some cause is established. A most distressing condition follows. The gingival borders encircling the lower jaw become the seat of severe inflammation and ulceration. This same condition the writer had from local irritation induced by partial superior denture, only it was located upon the superior arch instead of the inferior.

The presence of any irritating local condition, which may be induced by *salivary* or *sanguinary calculus*, dental decay, deep or superficial, mal-occlusion or non-occlusion of teeth, pericementitis, dead or decomposing pulps, loose or unopposed teeth, we all recognize that the presence of any one of these conditions may induce a trifling or trivial irritation, but any one of them coexisting with certain other morbid states or predispositions, constitutional or otherwise, and the disturbance and suffering would be greatly exalted.

Let us appreciate the fact, then, that to conduct a clinical inquiry with precision, satisfaction, and ease we need to follow some well-digested and arranged plan. If we have not this, we may wander about, jumping at very unsafe or unsatisfactory conclusions.

LIME FORMATIONS IN THE PULP-CHAMBER.¹

BY EDWARD C. KIRK, D.D.S., PHILADELPHIA.

LIFE has been defined by Mr. Spencer as "the continuous adjustment of internal relations to external relations," which formula is intended to apply to life in its normal or physiological expression. Aberrations from this standard are what we understand as pathological conditions, and constitute disease. This Ziegler states is a deviation of some of the vital manifestations from the normal: the deviation being conditioned by external influences. It is from the stand-point of this conception of the equilibrium of the vital forces

¹ Read before the Odontological Society of Pennsylvania, October 14, 1893.

in relation to their environment which would seem to best enable us to understand the particular deviation from the normal health of the dental pulp which we are to consider this evening.

The dental pulp functionally considered is the formative sensitive organ of the dentinal structure of the tooth. It is developed in the early weeks of intra-uterine life from the subepithelial connective tissue of the fœtal jaw as the dentinal papilla. This structure in its earlier stages is histologically homogeneous in character, but as development progresses there is formed upon its periphery, about or near the fourth month, a layer of columnar cells, the odontoblasts, which constitute the so-called *membrana eboris*. It is this layer of cells which is immediately concerned in the production of dentine. The deeper portion of the pulp, consisting of embryonal connective-tissue cells, develops a net-work of fibrous connective tissue, with its characteristic bundles of fibres and spindle cells, through which pass the blood-vessels and nerve fibrillæ, and these together constitute the normal tooth-pulp.

The odontoblasts are a modified or specialized form of the connective cells from which they originated. They send out fibrils or rod-like processes towards the enamel, and around these processes is deposited the calcific material giving to the dentine its characteristic tubular structure. The calcific material in question has been called, by Professor Harting, of Utrecht, calcoglobulin. The process of dentine calcification takes place from the periphery towards the centre; hence the area of the pulp becomes gradually diminished through increasing age, during which time the fibrillæ of the odontoblasts elongate, while the cells themselves undergo little or no diminution, simply receding before the advance of the progressing calcification.

It is perhaps not possible to state with precision at what period the process of calcification is normally completed. It has been demonstrated, however, that after a point has been reached where the functional activity of the odontoblasts has naturally ceased, they, having apparently accomplished their normal limit of work, have been again excited through some source of irritation, either local or systemic, to renewed activity, whereby their function has been reawakened and a new deposit of pathological dentine has been thus formed, which is described as secondary dentine. The location, structure, and extent of this secondary dentine formation are no doubt determined by the nature of the irritant which has acted as the exciter. For example, the stimulation may be so localized as to include but a limited area of the *membrana eboris*, so that

the odontoblasts of only that territory will be excited to the deposition of calcoglobulin, while the balance of the pulp will not be affected.

Many instances of this localized formation of secondary dentine are met with in dental practice, and their exciting cause is usually easily ascertained. Thus, in the progress of caries, where the process is so slow that the pulp is not overstimulated through the irritation to the dentinal fibrillæ, we frequently find a deposit of secondary dentine upon that portion of the wall of the pulp-chamber which is being directly approached by the carious process. In fact, as Miller has beautifully shown in his work, "*The Micro-Organisms of the Human Mouth*," the merest break in the enamel covering is immediately taken cognizance of by the pulp, so that the zone of dentine traversed by the irritated fibrillæ undergoes a certain modification in its structure, which, though not clearly made out as to its character, is still sufficiently marked to constitute a change in texture and refractive properties easily visible under the microscope. When the carious process has proceeded until the pulp is nearly approached, we frequently find a large deposit of secondary dentine which seems to be erected as a barrier to the progress of the carious action. Indeed where the progress of caries has not been sufficiently rapid to overtake the building-up process by the pulp, it is not unusual to find the whole pulp-chamber filled solidly with a deposit of this character.

Sources of irritation other than caries may and do bring about this same deposit. The irritation from thermal changes through metallic fillings frequently induces a local deposit of secondary dentine. Mechanical irritation at the cervical borders of teeth by the abrasive action of brush and powder too vigorously used, ill-fitting clasps upon artificial dentures, erosion of the buccal and labial surfaces of teeth, the mechanical abrasion of their grinding surfaces by attrition of the teeth and their wearing down by mastication, all tend to produce the same condition.

It is necessary at this point to distinguish between certain varieties of calcific changes which take place in the pulp. So far we have concerned ourselves only with those deposits which may in the light of our present knowledge be attributed to excessive functional activity of the odontoblastic layer of the pulp; these are true dentine neoplasms and are always found to be in direct organic union with the walls of the pulp-chamber. Microscopic examinations of these secondary deposits of dentine prove them to be true secretions of the odontoblasts with their fibrillar elements, though often distorted and irregular, directly continuous with those of the

normal dentine upon which the secondary deposit is superimposed. But in addition to the secondary deposit just considered, concretions of calcoglobulin are found free in the pulp tissue having no connection with the walls of the pulp-chamber. These concrements present an endless variety in size, shape, number, and histological structure. We find very small, more or less globular nodules, others larger and more irregular in outline, seemingly an aggregation of a number of smaller globular elements united in a mulberry mass, still larger and more irregular masses without any definitely describable shape, or we may find in the same pulp-specimen a variety of masses of many sizes, the whole pulp-tissue being infiltrated with small sandy concrements. Finally, we find nodular growths attached to the walls of the pulp-chamber by a constricted pedicle of the same material. These latter are regarded by Professor Black as true pathological tumors of dentine produced through some perverted action of a localized collection of odontoblasts, and he calls them for that reason odontomes.

The etiology of the formation of free nodular concrements in the pulp tissue is involved in obscurity. While recent investigations have thrown much light upon the structure and histological character of these formations, and a reasonably copious literature has resulted, still it is difficult to find lines of agreement among investigators when the question of the etiology of these formations is at issue. The older writers generally regarded the free calcific growths in the pulp tissue as products of the odontoblastic layer on the hypothesis that they were first developed as secondary dentine in contact with the wall of the pulp-chamber by a pedunculated attachment which was later absorbed, thus setting free the globular end of the growth in the pulp tissue. This view has been definitely proved to be an error. Later researches, notably those of Iszalai, Weil, Hamer, Witzel, Miller, Baume, Black, Bödecker, and many others, have shown that nodular concrements arise in connection with the bundles of fibres and spindle-shaped cells of the connective tissue of the pulp-growth independently of the odontoblasts.

The exact nature of this calcific degeneration of the connective tissue of the pulp is not clearly made out, and it is the various and conflicting views entertained with regard to it that give rise to the confusion respecting the character of these formations as well as to the great variety of names by which they are known. In America they are commonly called "pulp-stones." They have received the names "odontomes," "denticles," "pulp-nodules," "odon-

theles," etc. One author (Schlenker) has classified them under no less than six different names. The name "odonthele," proposed by Iszlai at the Tenth International Medical Congress at Berlin, is fairly satisfactory; but should, as Miller suggests, be more accurately limited by a prefix which would distinguish these internal pulp formations from the enamel tubercles occurring on the outside of the tooth. The term "endodontheles" would meet the condition more nearly.

The differences in the histological structure of these formations, as seen by different observers, has been largely responsible for the confused state of our knowledge concerning their origin. It is not that the calcific change of connective tissue presents any especially remarkable features, but the resulting product is so variable in its microscopic appearances that it becomes difficult to relate it to the normal processes which result in the formation of the other hard tissues of the body. Thus, nodules will be found presenting a structure closely resembling dentine, while others will be more like bone or cement in character; hence arise conflicting theories as to the method of their formation.

The weight of evidence, so far as the writer from a very imperfect knowledge of the subject may be allowed to judge, seems to show that these formations are the result of certain stimuli local or systemic, perhaps both, whereby the connective tissue of the pulp undergoes a calcific organization characterized by the deposit of calcoglobulin throughout its mass, and that this deposit takes place in relation to the spindle cells of the connective tissue of the pulp in much the same manner as dentine is formed in connection with the odontoblasts. It has not been shown, so far as I have been able to ascertain, whether the spindle cell itself becomes calcified, as it is said to occur in the case of the ameloblast in the formation of enamel, or whether the calcoglobulin is excreted and formed around the fibrillar prolongations of the spindle cells as calco-spherites, which gradually grow by accretion of new material and eventually coalesce with similar formations to form large masses. Hamer, of Utrecht, has shown that the calcification follows the course of the fibres in the bundles of connective-tissue elements; that these latter become embedded in the new formation, giving to it its striated or tubulated appearance, resembling dentine to some extent; as the growth increases small capillary vessels and nerve filaments become included in the mass, which remain as open spaces in the texture of the formation, giving it its relationship in appearance to bone, vaso-dentine, and cement substance.

It will be remembered that the different cellular elements of the pulp tissue had a common origin in the homogeneous cellular structure of the dentinal papilla. The differentiation of these elements is not great morphologically, and it is not unreasonable to suppose that they should present a functional resemblance when they are affected by an irritant which disturbs the vital equilibrium sufficiently to turn the balance towards the pathological side. Overstimulation of function results in paralysis; the harmonious adaptation of internal relations to external relations has been destroyed, and normal life is no longer possible. In the case of pulp-calcification it does not mean its immediate destruction, for the process may continue over a long period of time; but, given the continuance of the irritation, the result is inevitable, for the pulp-chamber becomes filled with a solid mass and its function is destroyed.

But little is known of the systemic causes which lead to pulp calcification. It is believed that plethoric individuals are more likely to be subject to it than are those of anæmic habit. This view seems probable, inasmuch as the nutritional vigor of such individuals is over-active, and any cause which tends to an increased vascular supply to the pulp favors its calcific degeneration. Of this we have good clinical evidence. So far as age is concerned no class of teeth appears to be exempt. Nodules have been found in non-carious as well as in carious teeth. I observed them in a large number of cases in the first permanent molars of children at the Institution for the Deaf and Dumb in this city some years ago, associated, however, with a pronounced effort at arrestation of the carious process throughout the denture, a result which I have attributed to the greatly improved sanitary and hygienic conditions provided by the institution in comparison with the former condition of the children, which in connection with an abundance of wholesome food had markedly raised the nutritional standard in these cases and, among other expressions, stimulated the pulp to increased functional activity.

The diagnosis of calcific degeneration is extremely difficult where no exposure is present. The most reliable means known to me is the application of cold during the paroxysm of pain supposed to have its origin in this disorder, pain, more or less severe, paroxysmal, and neuralgic in character, being the only well-defined symptom.

The treatment is devitalization and filling of the root-canal. The devitalization of a pulp under those circumstances, as is well known, is a matter often of considerable difficulty. Such pulps show

a resistance to the action of arsenious acid which is as persistent as it is remarkable. It can generally be accomplished by repeated trials, but where time is an object it is often preferable to administer a general anæsthetic and remove the contents of the pulp chamber by direct operation. Or the operation may be accomplished under the methyl or ethyl chloride spray. The resistance to the action of arsenic is probably due not to excessive vigor of the pulp, but rather to its diminished vitality with corresponding loss of power to absorb the drug through its altered and diminished vascular system.

The mechanical obstacles presented by nodular concretions in the pulp-chamber are often a great source of difficulty in operating for the removal of a pulp so affected. It can nearly always be accomplished by care and patience with suitable drills and canal reamers.

I have in what I have said merely attempted to outline some of the features of this peculiar condition. There are many interesting phases of it which I trust may have suggested themselves to your minds, and which will be brought out in the further discussion of the subject to-night.

NOTES ON THE HISTORY OF ANÆSTHESIA.¹

BY DR. JAMES McMANUS, HARTFORD, CONN.²

At Greenfield last year a vote was passed requesting me to give an historical sketch of modern anæsthesia at this meeting, and in response to that invitation I will read to you a concise and condensed statement, relating incidents and experiments that led up to, and the facts regarding the discovery of, anæsthesia.

In looking up the records of the centuries we find mention made of various medicines that have been used for the purpose of

¹ Read at the Union Meeting of the Connecticut Valley Dental Society and the Connecticut State Dental Association at Hartford, Conn., May 16, 17, and 18, 1893.

² [While the principal facts connected with the discovery of anæsthesia have repeatedly been told and have become part of the history of the profession, the "Notes" by Dr. McManus seem to give to the story a new life, as they graphically depict the experiences of the time. The duty of keeping alive the memory of Dr. Wells remains with each generation, and it is therefore with unusual pleasure that we give space to this paper.—Ed.]

rendering patients insensible to pain while undergoing surgical operations.

Homer mentions the anæsthetic effects of nepenthe.

Dioscorides and Pliny allude to the use of mandragora.

Lucius Apuleius, who lived 125 A.D., and whose works were republished in the fourteenth century, says that if a man has to have a limb mutilated, sawn, or burnt, he may take half an ounce of mandragora wine, and whilst he sleeps the member may be cut off without pain or sense.

A Chinese physician who lived in the third century, named Hoatho, gave his patients a preparation of hemp, whereby they were rendered insensible during surgical operations.

The soporific effects of mandrake are mentioned by Shakespeare, as well as other draughts, the composition of which are not given.

After the lapse of centuries, Dr. B. W. Richardson, of London, procured specimens of mandragora root and had wine made from them, which he found by testing to have the properties ascribed to it by the ancient writers.

Theodoric, in a surgical treatise as early as the thirteenth century, gives directions how to prepare a "*spongia somnifera*" for inhalation before operations.

Dr. Simpson makes the statement that ether was known in the thirteenth century, that its formation was described in the sixteenth century by Valerius Cordus, and was first named "ether" by Frobenius in 1730.

A German work published in 1782 by Meissner mentions the case of Augustus, King of Poland, who underwent an amputation while insensible by the use of a narcotic.

Herodotus refers to the practice of the Scythians of inhaling the vapor of a certain kind of hemp to produce intoxication, and on September 3, 1828, M. Gerardin read to the Academy of Medicine of Paris a letter describing surgical anæsthesia by means of inhaling gases.

The ancients did know of and used the narcotics named, and possibly with all success that is claimed by these writers; but the compounds they made, and the manner of administering them, were not generally known outside their circle or territory, and after years their use was practically abandoned. Opium, seemingly, was the one drug that for many years prior to 1844 the surgeons mainly relied on to give relief from pain. It is on record that the ancient Greeks, Romans, and Arabians were familiar with and employed many volatile substances that they found acted more promptly

when inhaled than when taken into the stomach, and after the discovery of oxygen by Priestley and Scheele in the middle of the last century, experiments were made with gases by physicians for the cure of diseases, especially of a consumptive type. A medical institute was established at Bristol, England, in 1798, and Sir Humphry Davy was appointed superintendent. While there he made a study of the effects of nitrous oxide, or laughing-gas, and after making many experiments with it, he made this remarkable statement early in 1800: "As nitrous oxide gas appears capable of destroying physical pain, it may probably be used to advantage during surgical operations in which no great effusion of blood takes place." He also stated that he had inhaled the gas and secured relief from pain while cutting a wisdom-tooth.

For more than forty years medical and scientific men were experimenting with the gas, the chemical and medical professors as well as popular lecturers gave entertainments with it, and always with watchfulness over their subjects for fear that in their excitement they might injure themselves, which they not infrequently did, and were not conscious of at the moment; and all these years the onlookers and lecturers could not see the great blessing that laughing-gas was offering to them, and tempting some one to lift to a nobler use than that of a mere means of amusement.

Professor G. Q. Colton gave a course of lectures on chemistry and natural philosophy in Hartford early in December, 1844; to popularize as well as amuse the audiences at these lectures the exhibition of the effects of laughing-gas on willing subjects was made a special feature of the entertainments. Dr. Horace Wells, well known in Hartford as a skilful dentist, attended with his wife the lecture given the evening of December 10, 1844. Dr. Wells inhaled the gas; the effect not being as pleasant as his wife wished for, she reproached him on the way home for taking it and making himself ridiculous before a public assembly. Dr. Wells went to that lecture to see, hear, and learn. He inhaled the gas, and subsequently watched its effects on others.

The exciting incident to him at the evening's entertainment was when Mr. Samuel A. Cooley, a well-known Hartford man, gave a lively exhibition of the effects of the gas by running and jumping about and falling, striking his legs against the wooden settees, and acting apparently perfectly unconscious of possible danger. After the effects of the gas had passed off, Dr. Wells asked him if he was not hurt, and he replied he did not know it at the time, but on looking at his legs found them bleeding from the injuries he had

received. Dr. Wells, turning to Mr. David Clark, said, "I believe a man, by taking that gas, could have a tooth extracted or a limb amputated and not feel the pain."

Before leaving the lecture-hall Dr. Wells asked Mr. Colton whether one could not inhale the gas and have a tooth extracted without feeling any pain, and he replied that he had not given the subject any thought; that he had been giving the laughing-gas for over a year and such an idea had not occurred to him, and could not express an opinion. Dr. Wells then said that he was inclined to try the experiment on himself and have a troublesome tooth extracted if he would bring a bag of the gas to his office the next day. Late that evening Dr. Wells called on Dr. Riggs to tell him that he had attended the lecture of Professor Colton and with others had inhaled the gas, that Mr. Cooley had injured himself and was not conscious of it at the time, adding, "If he did not feel pain, why cannot the gas be used in extracting teeth?" A long discussion followed as to whether it would be right or safe for them to make such an experiment with possible danger staring them in the face, but Dr. Wells was so confident and fearless that he agreed to take the gas and have a tooth extracted the next day if Dr. Riggs would perform the operation. As requested, the next morning Professor Colton brought a bag of the gas to the office of Dr. Wells. There were present Professor Colton, Drs. Wells and Riggs, and as on-lookers a Mr. Colton and Mr. Samuel A. Cooley, the star performer at the entertainment the night previous. Dr. Wells sat down in the operating-chair, took the bag into his hands and inhaled the gas until he was insensible, when Dr. Riggs extracted an upper wisdom-tooth. Dr. Wells remained unconscious a short time, and on recovering exclaimed, "I did not feel it so much as the prick of a pin. A new era in tooth-pulling. It is the greatest discovery ever made," and remarks of a similar nature, being, naturally, perfectly delighted with his successful experiment. The not improbable value of nitrous oxide gas, as suggested by Humphry Davy in 1800, proved a certainty December 11, 1844, when the first surgical operation was successfully performed on Dr. Horace Wells while under its influence. On that day modern anæsthesia was given to the world, and nitrous oxide gas proved to be a blessing to suffering humanity and the forerunner of all other anæsthetics.

I will read to you brief extracts from testimony given under oath before authorized officials, commencing with Professor Colton, who stated that Dr. Horace Wells came to him to learn how to prepare the gas, that he gave him full information, and advised him to

go to Boston for necessary apparatus, as he could not furnish it. A few weeks after leaving Hartford he saw a paragraph in the papers announcing that Dr. Wells was extracting teeth without pain, and he stated on several occasions in connection with that paragraph how and when the discovery originated. Dr. J. M. Riggs testified that "We were so elated by the success of this experiment that we turned our attention to the extraction of teeth by means of this agent, and continued to devote ourselves to this for several weeks almost exclusively."

Dr. E. E. Marcy testified that while a student at Amherst College he had inhaled the gas, and also the vapor of sulphuric ether, and knew that the operation and effect of these substances were nearly similar, but he did not know that one or the other would produce insensibility to pain until Dr. Wells made the announcement. At the invitation of Dr. Wells he called at his office and witnessed the gas given and a tooth extracted, the patient showing neither excitement nor the slightest consciousness of pain. Dr. Marcy then suggested to Dr. Wells the use of sulphuric ether, his impression being that it possessed all the anæsthetic properties of the gas, was equally safe, could be prepared with less trouble, was less expensive, and could always be kept on hand. Dr. Marcy said he would prepare some ether and give him some of it, and also would make a trial of it himself in a surgical case that he expected to operate on in a few days. A few days later the ether was given to the patient alluded to, and an encysted tumor the size of an English walnut was cut from his head. Dr. Wells was present, the operation was successful, and conclusively proved the anæsthetic properties of ether vapor. Dr. Wells then told of a conversation held with Dr. Riggs regarding the effects of both ether and gas, and gave the opinion of Professor Rogers, of Washington (now Trinity) College, that the vapor of ether was much more dangerous than that of the gas.

"At the urgent request of Dr. Wells I read what I could easily procure in relation to both articles, and gave as my opinion that, as the gas was more agreeable and easy to inhale than the ether, it was, upon the whole, more safe, and equally efficacious as an anæsthetic." Dr. P. W. Ellsworth was also asked respecting the comparative safety of nitrous oxide gas and sulphuric ether, and he gave his opinion in favor of the gas, and advised Dr. Wells to confine himself to that agent. In the month of January, 1845, Dr. Wells went to Boston for the purpose of making known his discovery. He obtained permission of the elder Dr. Warren to address his class in

the medical college, and at the close of his talk he gave the gas to a boy and extracted a tooth. The boy screamed out, but on recovery said he did not know when the tooth was drawn. The students hissed and cried humbug. They were not willing to treat seriously any attempt to investigate the anæsthetic properties of the gas.

Dr. William T. G. Morton had been a student of dentistry with Dr. Wells in 1841 and 1842, but was living in Boston at this time, and renting an office of Dr. C. T. Jackson.

In conversation with these gentlemen, they both tried to discourage him, having no faith in his statements, and advised him to give up the use of the gas. Dr. Jackson, noted then as a chemist, treated the subject as lightly as did the medical students, calling it a humbug. That a dentist from a country town could appear in Boston and announce to the world that he had made such a grand discovery was not to be credited, and Dr. Wells soon learned that not one of the influential medical or scientific men in that learned city could be induced to interest themselves in investigating the properties of the gas or lend him any assistance whatever while he remained in that city. He returned to Hartford greatly depressed and in poor health, but in a short time was able to resume his practice. During that and the following year he continued to give the gas freely, and when not able from any cause to attend the patients, he would bring or send them to the office of Dr. Riggs to have him give the gas.

In the *Boston Medical and Surgical Journal* of June 18, 1845, there was an article written by Dr. P. W. Ellsworth, of Hartford, Connecticut, on the "Modus Operandi of Medicine," in which he mentions that the nitrous oxide gas has been used in a number of cases by our dentists, and has been found to perfectly destroy pain, and no unpleasant effects follow its use. Dr. Morton visited in Hartford during the summer of 1845, and called with Dr. Wells on Dr. Riggs to talk about the gas, and wanted them to give him some, and tell him how it was prepared. Dr. Wells referred him to Dr. Jackson, of Boston, who he said could prepare it for him, or tell him how it should be done, as he knew all about it.

In the summer of 1846, Miss Elizabeth Williams, of Hartford, met Dr. Morton in Stafford Springs, Connecticut; learning that he was a dentist, she told him her experience with the laughing-gas, and that Dr. Wells had extracted a tooth for her on the 6th of March, 1845. He asked her about the effect and operation of the gas, and gave no intimation to her that he had any knowledge of the gas or of any other anæsthetic. Drs. Wells, Riggs, and Terry,

of Hartford, continued to give the gas in their practice with success, and great was their surprise when they learned that Drs. Jackson and Morton were heralded in the Boston papers in the fall of 1846 as the discoverers and the inventors of a compound which they stated by breathing into the lungs induced so deep a slumber as to enable them to perform the most painful surgical operation with entire unconsciousness on the part of the patient.

Dr. Morton made his so-called discovery September 30, 1846, when he extracted a tooth for Mr. Eben Frost under the influence of his pretended compound.

He made known the result of his experiments to Dr. Jackson, and they found, as Drs. Marey and Wells, of Hartford, had demonstrated nearly two years earlier, that by inhaling the vapor of sulphuric ether it would produce unconsciousness, and surgical operations could be performed without pain while under its influence.

Soon after, he called on Dr. Warren, who promised him an early chance to test his compound, and on the 16th of October, 1846, he made his first experiment at the hospital, and on the 17th another, both surgical cases.

Boston surgeons were at last convinced that anæsthesia had been discovered, and Boston men were the discoverers. The managers of the Massachusetts General Hospital were now ready to claim for their institution the honor and credit of first demonstrating this great fact to the world, and Boston surgeons, Boston newspapers, and the public were now very much interested, and only too ready and anxious to assist the assumed discoverers in introducing their pretended discovery and advising its use in general surgery. Dr. Morton wrote to Dr. Wells, October 19, telling him of his discovery, stating that he had patented it, and wishing to know if he would not like to visit New York and sell rights to use it. Dr. Wells replied to that letter, October 20, that he would be in Boston soon, and he and his wife took an early train the Saturday after, arriving in Boston about mid-day. After dinner he called on Dr. Morton, remaining with him about two hours. On his return Mrs. Wells asked him if Dr. Morton had discovered anything new, and he replied, "No; it is my old discovery, and he does not know how to use it." He said he perceived what it was on entering his room; he knew it was nothing but ether. On being asked if he would assist in selling his patent rights, he replied, "No, he would have nothing to do with him."

Dr. Wells and wife returned home on the following Monday.

The statement made in the letter of October 19 to Dr. Wells,

that he had patented his compound, was not true, and at the interview a few days later, in Boston, it did not occur to him that Dr. Morton intended to deprive him of the credit of the original discovery, but that he did claim the discovery and application of a new and more convenient agent. The possible money value that might accrue to them from a vigorous pushing of the discovery set the doctor and dentist to figuring out futures. They decided to apply for a patent, which the Patent Office records say was done in the names of Drs. C. T. Jackson and W. T. G. Morton, October 27, 1846; but before the patent was granted, Dr. Jackson, fearing he might be censured or even expelled from the Massachusetts Medical Society if he took out a patent, made an assignment, which apparently gave to Dr. Morton all his right, title, and interest in the then assumed invention, but for which act he obligated Dr. Morton to pay him ten per cent. of all he made out of it, and later on, through his counsel, he demanded twenty-five per cent. of all the profits both at home and abroad, which Dr. Morton refused to give.

The patent was granted November 12, 1846. Circulars were printed with the names of Drs. Jackson and Morton as the discoverers and inventors of a compound that later proved to be the well-known fluid sulphuric ether, and they were distributed broadcast. Agents were sent out to sell rights. The doctor, dentist, or anybody, qualified or not, who would pay the price, could buy the right to use this wonderful and powerful agent.

The scale of prices being, for cities of over one hundred and fifty thousand inhabitants, two hundred dollars; fifty thousand and under, one hundred and fifty dollars; cities under five thousand, thirty-seven dollars, for a term of seven years.

The following advertisement was published in the *Boston Evening Traveller* of November 29, 1846, signed by Drs. N. C. Keep and Wm. T. G. Morton:

"The subscribers, having associated themselves in the business of dentistry, would respectfully invite their friends to call on them at their rooms, No. 19 Tremont Row. They confidently believe that the increased facilities which their united experience will afford them of performing operations with elegance and despatch, and the additional advantage of having them performed without pain, by the use of the fluid recently invented by Drs. Jackson and Morton, will not only meet the wishes of their former patients, but secure to them additional patronage."

This was a unique appeal to the Boston citizens for patronage,

equalling, if it does not far surpass, many of the advertisements that are to be seen in the newspapers of our day.

The physician or dentist that indulges in a much less flagrant style of advertising to-day is barred out of both medical and dental societies.

Soon after the extraction of the tooth for Mr. Frost by Dr. Morton, Dr. Jackson sent a letter to a friend in Paris, France, giving the particulars of his pretended discovery, stating that he had persuaded a dentist in Boston to administer the vapor of sulphuric ether to his patients when they wished to have teeth extracted, and they suffered no pain during the operation; and later a second letter, stating that it had been used in the Massachusetts General Hospital with great success. These facts he wished his friend to communicate to the Paris Academy of Sciences. Soon after the letters were sent there was a falling out between the Boston discoverers. The public then learned from their controversy of the bitter feeling existing, and found, also, that each one denied that the other had any just claim for the credit of the discovery.

The Paris Medical Institute, in response to the letters sent by Dr. Jackson, and with the knowledge only of his claim and that of Dr. Morton, awarded to each one the sum of two thousand five hundred francs; to Dr. Jackson for the discovery of the principle, and to Dr. Morton for the application of it. The Institute at the time knew nothing of the claims of Dr. Wells. While the controversy was going on so bitterly in Boston, Dr. Wells decided, partly on account of his health, to take a trip to Europe, and while there to interest, if possible, and to present his claim as the discoverer of anæsthesia to the English and continental surgeons. While in Paris he made the acquaintance of the American dentist Dr. Brewster, through whose good influence the subject was again and properly brought before the French Academy of Medicine. On Dr. Wells's return to this country he found the influence of medical and scientific men, the professional journals, and newspapers were all in favor of sulphuric ether, and the tide running in favor of the claims of Drs. Jackson and Morton.

Late in the year 1847 a new agent, chloroform, was introduced by Professor James Y. Simpson, M.D., of Edinburgh, Scotland, and that for a time seemed likely to supplant sulphuric ether. Dr. Wells gave the nitrous oxide gas on January 1, 1848, to Henry A. Goodale, and Dr. P. W. Ellsworth amputated his leg. Also, January 4, gave the gas to Mrs. Gabriel, and Dr. S. B. Berresford removed a fatty tumor from her right shoulder. Dr. Wells later in the month went

to New York to visit the hospitals and to urge his claims with the surgeons in that city. The worry, annoyance, and injustice done him by the rival claimants, increased by the experiments he was making with different anæsthetic agents, brought on serious mental disturbance, and under these influences, disheartened and despondent, he put an end to his sufferings, January 24, 1848.

The following letter arrived soon after his death from his friend Dr. Brewster, dated

“PARIS, January 12, 1848.

“MY DEAR WELLS,—I have just returned from a meeting of the Paris Medical Society, where they have voted that to Horace Wells, of Hartford, Connecticut, United States of America, is due all the honor of having first discovered and successfully applied the use of vapors or gases whereby surgical operations could be performed without pain. They have done even more, for they have elected you an honorary member of their Society. This was the third meeting that the Society had deliberated upon the subject. On the two previous occasions Mr. Warren, the agent of Dr. Morton, was present and endeavored to show that to his client was due the honor, but he, having completely failed, did not attend the last meeting. The use of ether took the place of nitrous oxide gas, but chloroform has supplanted both, yet the first person, who first discovered and performed surgical operations without pain, was Horace Wells, and to the last day of time must suffering humanity bless his name.

“Your diploma and the vote of the Paris Medical Society shall be forwarded to you. In the interim you may use this letter as you please.

“Believe me ever truly yours,

“BREWSTER.”

Drs. Jackson and Morton from the start had persistently stated that the nitrous oxide gas was a failure; that it was not an anæsthetic; and they also as persistently ignored the fact that Drs. Wells and Marcy had used sulphuric ether with success, but had decided, in consultation with Dr. Ellsworth, that as the gas was more pleasant and agreeable to take, as well as less dangerous, it would be better to continue its use in dental operations. The death of Dr. Wells left the field open for them, and as the new agent, chloroform, was making a very successful record, it soon became so popular that the use of gas was given up and by many forgotten.

Hartford had no medical school, hospital surgeons of national reputation, or professional journals to compete with Boston, that had all these advantages, while the great influence of Boston surgeons, Boston journals, and Boston wealth were freely given to aid the Boston claimants in their attempt to rob Dr. Wells of the honor and credit of his discovery. Boston influence aided them in their successful appeals to the rich and the profession for remuneration,

and Boston money helped them in wining and dining a memorable lobby influence in its attempts to get through Congress a bill granting them one hundred thousand dollars for the use of their pretended discovery by the army and navy. Through the efforts of the Hon. Truman Smith, United States senator, and the members of Congress from Connecticut the passage of this bill was defeated.

Soon after the introduction of chloroform, and the death of Dr. Wells, the use of the gas was abandoned, but the surgeons and the public were soon taught that with chloroform and ether they were dealing with uncertain and dangerous agents. The frequent deaths reported, and the ill effects that often followed their use, caused a feeling of dread on the part of both patient and operator, so that comparatively few cared or dared to risk taking or giving either of them.

From 1848 until 1863 the longing for a safe anæsthetic was universal; again, fortunately for suffering humanity, Professor Colton appears before the public as a lecturer and exhibitor of laughing-gas, and at a private entertainment to a specially invited party in New Haven, June, 1863, he related the history of the discovery of anæsthesia by Dr. Wells, stating that since that time he never had been able to induce a dentist to try the gas. Our old friend, and for many years treasurer of this Society, Dr. J. H. Smith was present, and then offered to try the gas again if Professor Colton would administer it. The professor said he would be very glad to do it, as he wished to again demonstrate what could be done with the gas. Their first patient was an old lady, for whom they extracted seven teeth; after recovering from the effects of the gas, she was so pleased with the result that she allowed Professor Colton to announce to his next audience her name and that she had had seven teeth extracted without pain, and without any ill or unpleasant effects from the gas. In three weeks and two days from that time Drs. Smith and Colton extracted over three thousand teeth.

Their success induced Professor Colton to abandon the exhibition business and to establish the Colton Dental Association in Cooper Institute, New York, devoted exclusively to the extraction of teeth with the gas.

In a pamphlet published by Dr. Colton in 1866 he says, "Whatever credit I deserve in connection with this matter is derived from the fact that I revived the use of gas, after it had been condemned, dead and forgotten as an anæsthetic from 1848 to 1863. In this revival and demonstration of the value of the gas as an anæsthetic

is not the world practically indebted to me for its use? If I had not revived it, by whom would it have been done? That poor Wells failed to convince the world of its value does not militate in the slightest degree against the honor he deserves as the discoverer of anæsthesia. He did all that a man could do under the circumstances."

Dr. Colton's great faith, and the co-operation and good work done by Dr. Smith, encouraged the dental profession to again take up the use of the gas, and the uniform success with it proved again to the public the true value of the gas as the original, safe, and reliable anæsthetic. Eighteen years after the death of Dr. Wells, there appeared in the *New York Medical and Surgical Reporter* of January 6, 1886, a report made by Dr. J. M. Carnochan, chief of staff in the New York State Emigrant Hospital, of three surgical cases that he performed, the patients being put under the influence of nitrous oxide gas by Dr. Colton, and February 10 of the same year he reported four more operations upon adults, making in all seven successful capital operations under the influence of the gas. After the first operations he said, "I have no hesitation in stating that the nitrous oxide gas as an anæsthetic is far superior to either chloroform or ether; the operation being attended by no nausea or sickness, and without the dangerous effects often incident to chloroform and ether. It is not improbable that had Wells lived and had the boldness to follow up his early successful experiments, chloroform and ether would never have been thought of as anæsthetics." In Dr. Carnochan's second report, giving a *résumé* of seven capital operations under the influence of nitrous oxide gas, he says, "I have also during this time used chloroform and ether in many operations, and my opinion in regard to the superiority of the nitrous oxide gas as an anæsthetic is still unchanged. I believe, however, that there is great room for improvement in the mode of administration of the gas."

The success attending the revival of the use of the gas, and the testimony given by the surgeons in New York and elsewhere, was simply a repetition of the success attained by Dr. Wells while he was alive and able to attend to his practice in Hartford.

The General Assembly of Connecticut in 1847 passed resolutions in favor of Dr. Wells as the discoverer of anæsthesia, and declared that he was entitled to the favorable consideration of his fellow-citizens, and to the high station of a public benefactor. The Court of Common Council of the city of Hartford passed resolutions to the same effect. The physicians and surgeons of the city united in

a testimonial declaring their belief in the justice of the claims of Dr. Wells. The Paris Medical Society, January, 1848, voted that to Dr. Horace Wells, of Hartford, Connecticut, is due all the honor of having first discovered anæsthesia.

The testimony of Professor Valentine Mott, M.D., of New York, December 20, 1852, is that Dr. Wells is entitled to the credit and honor of the discovery. Professor R. D. Mussey, of Cincinnati, Ohio, in a letter to the Hon. Truman Smith, United States senator from Connecticut, December 24, 1852, says, "I have long regarded Dr. Wells as entitled to the credit, and to the pecuniary award if any such consideration is to be made, for the invaluable discovery of anæsthesia."

Dr. C. H. Haywood, who was house surgeon in the Massachusetts General Hospital at the time Dr. Morton administered his pretended compound there, in a letter to United States senator Truman Smith, concludes with these words: "But before all let full and ample justice be done to that noble genius which first conceived the grand idea which has been the basis of all the experiments and the father of all the discoveries. To the spirit of Dr. Horace Wells belongs the honor of having given to suffering humanity the greatest boon it ever received from science."

In the early days it was difficult to prepare the gas in large quantities or to keep it on hand any length of time. Soon after the revival of its use in 1863 many improvements were made in apparatus for making gas, and, later, when the process was so perfected that dealers could furnish the gas to the profession in liquid form, in iron cylinders holding from one hundred to fourteen hundred gallons to be used from as desired, without danger of waste, loss of power or purity, all the former objections to its use were removed.

If Dr. Wells had been a resident of Boston, an M.D., and a member of the staff of the Massachusetts General Hospital, his discovery in 1844 would have been quickly accepted. As a stranger and a dentist, his claim as a discoverer and the evidence he had to sustain it, as well as the prediction made by Sir Humphry Davy many years before as to the probable properties of the gas, could not awaken enough interest in the minds of the stupid, stubborn, and jealous men that he appeared before to induce them to make another trial of the gas. They condemned it as a humbug, and suffering humanity was deprived of the blessing of an agreeable and safe anæsthetic for over twenty years.

Professor S. D. Gross, of Philadelphia, some years ago, when speaking before the American Medical Association, said that "Den-

tistry is the most important specialty in medicine: many people come into the world, and go out of it, who never require the services of other specialists; but no child is born who does not sooner or later require the services of a dentist.' Terse and true as this statement is, equally true is the statement that modern anæsthesia, in all the varied modes of its administration, is undeniably the result of a dentist's heroic experiment and discovery. It is also sadly true that it was two years after the discovery, and after repeated successful operations in the hands of Hartford dentists, before Boston surgeons could be induced to accept the fact that an anæsthetic had been discovered. The record is now well up in the millions of successful operations made while under the influence of the gas, with evidence accumulating daily, all over the world, that the gas is a safe and reliable anæsthetic, and with abundant testimony to prove that Dr. Wells was the first to submit to a surgical operation while under its influence. These facts cannot be blotted out by the efforts of magazine writers that either ignorantly or wilfully ignore, as does the inscription on the ether monument that stands in the public garden in the city of Boston, the claims of Dr. Horace Wells.

The monument in Boston commemorates the discovery of anæsthesia by inhalation of ether as first proved to the world at the Massachusetts General Hospital, October, 1846. It is a beautiful work of art, with bas-relief pictures that tell to the onlooker the great blessing that some one had given to suffering humanity. The inscription tells an untrue story, and the stranger seeks in vain for the name of the world's great benefactor.

On Bushnell Park, in Hartford, there stands a monument, erected by the State of Connecticut and the city and citizens of Hartford, commemorating this great discovery of anæsthesia first given to the world in Hartford, in 1844, with the name inscribed, and a portrait statue of Dr. Horace Wells, to whom alone belongs the honor of its discovery, and who gave it to the world, to be as free as the air we breathe.

It will be remembered that Dr. Carnochan was decided in his opinion as to the value of the gas in surgical operations. He reported in January and February, 1866, seven successful operations, one case being the removal of an entire breast and the glands of the axilla, for cancer. The patient was a lady in feeble health, suffering from disease of the throat and lungs, and general debility. In thirty-five seconds from the time she began inhaling the gas she was in a profound anæsthetic sleep. She remained insensible for sixteen consecutive minutes, until the operation was completed, and,

in forty seconds from the time the bag was removed, awoke to consciousness without nausea, sickness, or vomiting. With the added testimony of leading surgeons in New York, that the gas was the safest of all the anæsthetics, and with all the improvements for administering it, as also the certainty of being able to get and keep it on hand pure, is it not strange, to state it mildly, that surgeons should so persistently ignore the gas, and continue to give chloroform, ether, or both in combination, when about to perform simple operations, despite the fatal record that has so often given publicity to that class of cases? Dentists have proved the value of nitrous oxide. In years to come, it is barely possible, the surgeons may again wake up to its value and safety.

PREHISTORIC CRANIA FROM CENTRAL AMERICA.¹

BY R. R. ANDREWS, A.M., D.D.S., CAMBRIDGE, MASS.

At the Peabody Museum, at Cambridge, there is a collection of archæological treasures, recently found in Central America, that have especial interest to the dental profession. These, consisting of crania, parts of the skeleton, a collection of teeth curiously filed and inlaid, with a fine collection of pottery and instruments which were made from bone, stone, and from a volcanic glass, obsidian, together with carvings and statues, are soon to be on public exhibition. They are being arranged in cases and around the room, while large numbers of photographs, showing the site of the excavations, are arranged within the cabinets upon the walls.

In 1890 the expedition that obtained them was sent to Central America by Harvard University under the charge of Mr. John G. Owens, a young archæologist of great promise, who died at his post of duty after the explorations were about complete. The expense of this expedition was defrayed by certain wealthy Bostonians. Most of these archæological treasures were brought from Copan, Honduras, and certain other ruins found in Yucatan. Mr. C. P. Bowditch, of Boston, who has been very much interested in the expedition, has now the charge of the collection. Mr. M. H. Saville, to whom I am much indebted, and who was with the expe-

¹ A paper read before the American Academy of Dental Science, Boston, October 4, 1893.



Filed teeth of skull over one thousand years old. Photographed by R. R. Andrews from Central American Exhibit, Peabody Museum, Cambridge. (Skull, grave 14, Labna, Yucatan. Found by M. H. Saville.)

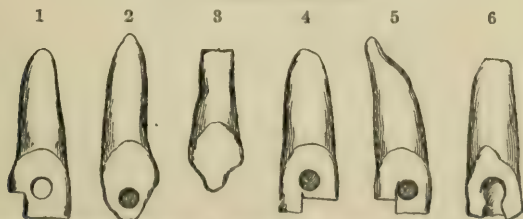
dition, states that the site where these things were found was covered by a growth of old trees, and it was necessary for the natives to cut these away before the excavations commenced. An ancient temple of some kind was long supposed to have existed here, from the fact that carved blocks of stone had been from time to time dug up in the locality, and the excavations proved this supposition to be a fact. A large temple was unearthed, together with a number of the homes of the former inhabitants, and graves were found under the floors of the rooms of the houses.

These graves were either stoned in or cemented, after the bodies had been partly covered with loose earth. Other graves were found in deep cemented chambers under the level of the ground, these chambers having the triangular arch commonly found in the buildings of this prehistoric people. The teeth on exhibition were obtained at Copan, Honduras. The skull, which is here shown, was taken from a grave at Labna, Yucatan, and is probably of a later date than the skeletons found at Copan, although it is undoubtedly prehistoric. It was found by Mr. M. H. Saville in grave No. 14, and in it may be seen how curiously were filed the six anterior upper and lower teeth. It is undoubtedly a Maya skull, of a person, probably a female, about twenty years of age, judging from the erupting wisdom-teeth. As no metal of any kind was found in any of the excavations, the teeth were probably ground down with coarse stone instruments. There is no decay in any of the teeth, all being



Skeleton 7, Mound 36.
Filed without inlay.

GROUP I.
(From Copan, Honduras.)

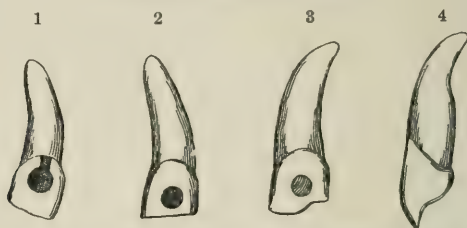


1, central incisor, inlay lost, filed; 2, cuspid, beautiful green jade inlay near cutting-edge; 3, bicuspid, root absorbed, probably by abscess; 4, central incisor, green jade inlay and filed; 5, central incisor, green jade inlay and filed; 6, cuspid, inlay lost, broken through to cutting-edge.

sound; but the left superior cuspid is just erupting about a quarter of an inch inside the arch. It would seem as though these early people were flesh-eaters, and perhaps cannibals, and that the teeth

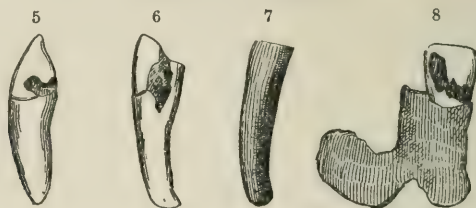
may have been filed in this manner for the purpose of better tearing of flesh. The photograph would imply that the skull was of considerable capacity, but it recedes very perceptibly from the orbits upward, so as to appear as though much flattened. The teeth that

GROUP II.
(Skeleton 8, Mound 36, Copan.)



Superior.—1, partially filled with a reddish cement (cuspid); 2, almost wholly filled with a reddish cement (incisor); 3, green jade inlay, no filing (incisor); 4, cuspid, same jaw, no filing and no inlay.

GROUP II.—*Continued.*



Inferior.—5, 6, cuspids decayed, no inlay, no filing; 7, stone tooth, carved from a dark stone; 8, decayed bicuspid and piece of socket.

were found at Copan, near by, are perhaps more interesting than the skull. Many of these have small circular pieces of green jade inlaid in a cavity that has been drilled by a stone or glass instrument in the face of the incisors and cuspids. These inlays are a little more than an eighth of an inch in diameter, the outer surface is rounded and brightly polished, and as perfectly fitted as it could be by the most skilled operator of to-day, with all the modern instruments at his command. In a few of the teeth the inlays have loosened so that it can be taken out, and there appears to be a white substance, perhaps a cement, between the inlay and the tooth, used to hold the inlay in place. It would seem that this inlay might be some mark of distinction, perhaps used in the mouth of a chief or head man of the people. Some of these teeth are filed and have no inlay. Some are inlaid and not filed. And some are both filed and inlaid. Quite a number of the teeth are badly decayed. Much of this decay appears to be at the cervical border, and in no case

does there appear to be any filling of any kind used to stop decay. None of them were filled for prophylactic purposes. In the teeth from skeleton 8, mound 36, found at Copan, two of the teeth that may have formerly had an inlay were partially filled with something that seemed like a red cement substance. None of these from this skeleton were filed, but in the lower jaw of the skeleton was found the most interesting curiosity in the whole collection to dentists,—a lower, left, lateral incisor that has been carved from some dark stone, and which has been implanted to take the place of one that had been lost. The tartar upon it would seem to show that it had been worn for some time during life. This implantation antedates Dr. Younger's experiments by about fifteen hundred years. Many of the teeth were so completely covered with tartar as to form masses nearly double their original size, and in one case an upper molar had the tartar deposited in such a way, and to such a degree, that it formed a shape that articulated on the gum of the lower jaw where the teeth had previously been lost. In one case, at least, the drilling of the tooth to produce a cavity in which to fit the inlay, had encroached upon the pulp, and there is distinct evidence of recalcification of pulp tissue at this point.

The whole collection is one of much interest, perhaps the most interesting evidence of prehistoric dental work that is to be found in any museum, and it is well worth a visit to Cambridge to see.

Reports of Society Meetings.

ODONTOLOGICAL SOCIETY OF PENNSYLVANIA.

THE regular monthly meeting of the Odontological Society of Pennsylvania was held at 1228 Walnut Street, Philadelphia, on the evening of October 14, the President, Dr. E. T. Darby, in the chair.

After the transaction of routine business the President introduced the essayist of the evening, Dr. Kirk, who read a paper on "Lime Formations in the Pulp-Chamber."

(For Dr. Kirk's paper, see page 894.)

Dr. Truman.—The essayist has covered the subject so thoroughly that there is little more to be said upon the question. We are all familiar with the elementary teaching that a certain amount of

calcific matter is to be found in pulps. This takes upon itself various forms. As he has very truly said, the irritation, the result of caries or from other causes, produces similar developments along the walls of the pulp-canal, but these are necessarily normal in their characteristics. The odontoblasts originate dentine, and this is very readily differentiated from other formations under the microscope. The calco-globulin deposited in the pulp evidently comes from the pulp itself without any agency of the odontoblastic layer. How this deposit is formed I cannot answer, and I fail to find any clear reply in the books. Further scientific investigation will be required to explain the subject. It takes different forms. It is found at times to be developed as part of the pulp, and at others will be separate from it and forcing the tissue apart.

Now, all these deposits in the pulp produce irritation, and I therefore take exception to the conclusions of Dr. Kirk, that the reason why arsenic does not operate where odontomes are present is because there is degeneration of the pulp. Exactly the opposite view seems to me to be the true one,—that it is because of the increased irritation in the pulp occasioned by the deposits. All pulps of this character give evidence of great vitality in the organism.

Pulp-stones, or odontomes, are not found in persons of anæmic condition or low vitality, but exist in strong and vigorous organizations. It follows, therefore, that the pulp will share in this increased vitality. The law applies here, that in proportion to the amount of irritation will be the extent of absorption of arsenic, consequently there will always be found difficulty in the destruction of a pulp in a hyperæmic condition. Hence in pulpitis the irritation must be reduced in order to produce any effect except an increase of inflammation by the use of this escharotic.

There is another point, a small one to be sure, in his paper that I must take exception to, and that is in regard to the grooves that are produced by the tooth-brush. I cannot believe the tooth-brush ever produces grooves in the teeth. The calcification of the teeth generally extends the subject somewhat in another and yet important direction. It is well known that histologists for years have been disputing in regard to the effect of caries in producing what Tomes calls the transparent zone, and to which Dr. Kirk has alluded. The tooth he removed from that elderly patient was nearly transparent, and a very fair example of this condition. Where there is a tendency to calcification of the tubes and the intertubular tissue, it will progress, in my opinion, until nearly the entire body

of the dentine is calcified, and will present under a microscope a perfectly transparent appearance. This is not necessarily confined to the old, but will frequently be observed in comparatively young persons. I have examined the teeth of a patient thirty-five years of age where the teeth were evidently being lost through over-density, and the observation by the microscope gave the same characteristics as senile teeth. Now, the theory of Wedl, that this is caused by fat globules, cannot, I feel, be sustained. To my mind it is simply increased deposition in the tubule from constant but slight irritation. The law as I formulate it is, slight irritation produces increased development, violent irritation produces destruction. The odontoblastic cell-layer is stimulated to increased activity by the slight irritation of caries, and irregular dentine is the result, and increased vitality means additional deposits in the tubes of calcific material, and also in the pulp. When we look at this matter in its entirety it becomes very interesting, but if our observations are limited to pulp-stones, we cannot, as I view it, clearly understand the subject in its various relations.

Dr. Christensen.—I have often met these formations in practice and have seen them frequently in Germany, probably because the teeth are neglected more there and that caries generally progresses farther before it is attended to. I think pulp-stones are rarely the cause of pain in the teeth. It would be of some value scientifically to find out the cause of their formation, and some writers have attempted to explain their origin, but with no satisfactory result.

Dr. Jack.—I have a word to say that is induced by the remark of Dr. Truman's, that in cases of odontomes there is probably some irritation of the pulp. I have two cases in illustration of that point occurring in the same mouth, which would seem to indicate that this is the case. Probably twenty years or more ago a laundry-woman came to me suffering with a great deal of pain in the left side of the face. I could not clearly determine the cause of the pain, as the teeth were sound. I was obliged in my ignorance, after making some slight application to that side of the mouth, to send her away, and asked her to come again if she had a recurrence of the pain. In a few days she returned, complaining in the same manner. I examined the teeth more carefully, and found some evidence of irritation of the pulp of the first molar. I extracted the tooth, which gave complete relief. I found upon opening the tooth that the pulp-chamber was quite filled with odontomes. Not long afterwards this woman returned, complaining of the other side of the mouth in the same manner. I sent her away, wondering

whether it would recur, and at the close of a hard day's work she returned again. I extracted the tooth and found it in the same condition. Owing to the unusual exercise while at work, more blood was sent to the head, which was probably the cause of the pain occurring at those times.

I will instance another case in which there was considerable increase of what appeared to be the vital or resisting power of the pulp, where the pulp-chamber was completely filled with a calcific deposit. The pulp had been capped for a good many years until irritation set in, and I found it necessary to devitalize it. The attempt at devitalization was an absolute failure. No means I could use would enable the pulp to take up sufficient arsenic to bring about its death. I used all means at my command to bring about such relief of the irritation as to make the arsenic at all acceptable to the pulp. Failing in this, I was obliged on account of the continuation of the pain to order its extraction. The tooth was broken in extracting below the bifurcation of the roots, and the pain still continued in the distal root in consequence of the presence of pulp-tissue there, and although I did not complete the observation of the root, the probabilities are that the nodular deposit continued throughout the whole of that pulp-canal.

Dr. Kirk.—I have been turning over in my mind the point raised by Dr. Truman in relation to the failure of the pulp to absorb arsenic,—a pulp undergoing this calcific change. I have not thought particularly on the subject, though it appears to me that it is because the pulp is undergoing a process of degeneration that the arsenic is not absorbed, its vascular supply being more and more cut off and obliterated by the deposit of the calcific material. I would like to have Dr. Brubaker's views, as he is an authority on the matter.

Dr. Brubaker.—I have not given the subject sufficient consideration to speak upon it.

Dr. Kirk.—Dr. Hamer finds evidences of hyaline deterioration of the coats of the vessels themselves where the pulp is undergoing the degenerative process. Now, if the tissue is histologically affected in that way, I do not see why it was not also functionally affected. That is the point I wish to bring out.

Dr. Jack.—The pertinent question here arises as to how arsenic acts upon the pulp in devitalizing it. As I understand the subject it is not usually by absorption and chemical combination with the elements of the pulp, but by the frequently expressed but not clearly explained hypothesis that the death is brought about by

paralyzation of the nervous tissue of the organ. In some instances the pulp appears to be devitalized, and if its removal cannot then be effected it will be found on a subsequent date sensitive to contact.

In the instances where pulps resist the arsenical application there generally is evidence of hyperæsthesia of the nervous elements of this organ, and only this condition appears to account for the frequent occurrence of resistance to the expected action of arsenic. This circumstance would appear to support the theory that the obtunding repression of arsenic often is by mere paralyzation, as has been designated. A probably better term would be shock of the tissue.

Dr. Peirce.—I regret not hearing all the paper read, but I fully sympathize with the writer where he spoke of the constitutional condition, which is a marked feature in the calcification of the pulp and the formation of nodules, and also the statement, which has a great deal of force, though often overlooked, and that is, the harmony that should exist between the inherent and external forces present in all tissues. Calcification occurs usually later in life, though in exceptional cases it occurs as early as thirty or thirty-five years, but generally at later periods. This tendency to an excess of lime in the system not only causes solidification of the teeth, but also the osseous structure; in this constitutional tendency to the deposition of lime we have the pulp sympathizing with other tissues. As to why it should or should not develop there as well as elsewhere, and what conditions facilitate its development, I cannot answer. My experience is that decay, either superficial or deep-seated, has an influence in stimulating pulp calcification. In cases of teeth lost by pyorrhœa alveolaris we not only invariably find the tubuli consolidated, but the pulp-chamber also almost obliterated. So there we have constitutional conditions which favor calcification of the pulp, solidification of the tubuli, and the general induration of the tooth structure. Earlier in life, when we have superficial caries, the dentine having lost its enamel covering, the pulp has been stimulated, and from that irritability of the pulp we assume at once there has been an excess of nutritive material sent to that organ, and from this excess of material we have the deposition of lime, so that when the tooth is extracted and made into sections we find the dentine thickened, and assume that there has been an irritation from the loss of the enamel, and with this a manifest recuperative power. I call it the recuperative power because it is in this way protecting itself from exposure.

As to the absorption of arsenic by the pulp, every dentist con-

siders it useless to make an application to an exposed pulp where the patient has been suffering acute pain from it for some hours; it does not have the desired effect. Some astringent is first applied so as to restrict the circulation at that point. My experience has been that as the pulp was inflamed there was an exudation from it, and during that exudation there was no absorption, everything being expelled rather than absorbed, hence the arsenic had but little effect, acting simply as a caustic on the part with which it came in contact. If a little tannin be applied to the pulp, or carbolic acid and morphia, and allowed to remain from twenty-four to forty-eight hours, and then the arsenous paste applied, better results can be secured.

As one advances in years the pulp-chamber grows smaller and the pulp grows less in size. May there not be constitutional conditions where the waste is so great that the pulp-chamber may be increased in size by the waste? I call to mind the case of a patient, thirty-five years old, who was suffering from acute neuralgia radiating from the upper central incisors, in which there had been superficial cavities for ten years. The pain was constant, except when the patient was taking large doses of quinine, which gave temporary relief. Finally, the two superficial fillings were taken out, and both pulps were found to be exposed, and the pulp-chamber was almost double its natural size, induced, I take it, by a systemic condition, because waste was greater than supply. During this period absorption of the walls of the pulp-chamber was evident until the small gold fillings had come in contact with the pulp. After the devitalization and removal of these pulps and the filling of the latter the patient was relieved from the neuralgic disturbance. Here was deficiency of nutrition, while in other cases we have excess. In reference to the influence of the tooth-brush, I have noticed cases where grooves had been cut in the teeth on one side of the mouth only, which was explained by the patient brushing more vigorously on the side affected than the other. In a case noticed, both bicuspid had decided grooves cut in them just above the line of the enamel where the gums had been brushed off and then the cementum cut away, while on the right side, where there was less force used, they were not cut away at all.

Dr. Truman.—How does the brush do this?

Dr. Peirce.—Simply by the friction of the brush and powder or dentifrice. I am satisfied that by constant use it can make an impression upon the cementum of the tooth.

Dr. Truman.—Why should it make it in grooves?

Dr. Peirce.—Because the brush is thrown around the mouth in that horizontal position.

Dr. Faught.—I believe Dr. Truman said he did not know why we have caleo-globulin deposit. Will the doctor tell why, "Of course, it takes various forms"?

Dr. Truman said he was not prepared to answer that question. He had been in hopes that this discussion would have thrown some light upon it, but he had not discovered that we had reached satisfactory conclusions.

Dr. Jack.—To give some explanation as to the manner in which the brush may cut the necks of the teeth, I would endeavor to give a mechanical reason by putting two pieces of card-board together. Now, if the friction of the brush were to extend over a perfectly plain surface, it is readily seen that the friction would be distributed over the whole surface, but the form of the enamel is such that it terminates not even by an acute angle towards the cementum, but it terminates by a parabolic curve at that point. We find this at the line of the junction between the enamel and cementum. If powder be used and the teeth are not very hard, it is plain to see how we have a mechanical explanation at once for the rapid cutting away of the teeth at that point.

Dr. Truman.—My explanation of these grooves would be simply this: that the brush has nothing to do with it, or at least, if it have any influence, it is indirect. At the margin of the gum there is always a pocket formed in which deposits of secretions of the mouth are found, and just in proportion as you have these pockets you have the development of pathogenic germs and fermentation and acid products. These necessarily destroy the surface; therefore it does not require a brush to explain the groove, it being simply erosion produced by acid action, aided by the impress of the lips and cheek.

Dr. Jack.—I agree with Dr. Truman that in most instances his diagnosis is the correct one, but in some cases I consider it to be the result of abrasion.

Dr. Kirk.—I consider the specimen which I presented as being in evidence, and I do not see how it would be possible for altered secretions to have caused the loss of the tooth-structure fully three-eighths of an inch in extent. An examination of the specimen will prove the point. It has been rubbed for the past seventy years, and it had had time to be worn down.

Dr. McQuillen.—I would offer a case in evidence, where, after directing the patient how to brush the teeth, the trouble had

ceased. If it had been erosion the pain would have been more acute.

Dr. Deane.—This brings to my mind a patient I had who, as she was growing older, thought her teeth were growing dark. She thought that if silver soap would brighten silver it would also brighten the teeth, and when she came to me I found the teeth cut away very badly from the use of this soap. I stopped that, and think the teeth are no worse off now than when she came to me.

Dr. Thomas.—The discussion upon pulp-stones from a scientific stand-point has taken a very wide range as to its cause and effect and its treatment; but there is one thing in regard to this I have failed to hear, and that is, how to detect pulp-stones in apparently sound teeth and healthy patients. We frequently have patients who are suffering from neuralgic pains and with no sign whatever in the mouth from which you can detect the cause. They will probably point to a tooth which may feel tender, but the only thing you can do is to send them away until there is some irritation that will respond to tapping of the tooth. I believe that pulp-stones are far more common than the profession think. I have been led to consider the question, How can pulp-stones be detected, and what is the cause of the trouble? It has been to me a very confounding thing. You cannot advise the extraction of a tooth if you can find nothing about it to give trouble; but there is one thing I have used in my practice to satisfy my own mind, and that is, if you will take the finger-nail and scratch, producing a vibrating sensation, it will produce pain in the tooth, or use an excavator to scratch with, and if there be irritation by pulp-stones it will respond to the vibration produced on the outside of the tooth.

I only mention it because I have heard nothing said as to the means of discovering pulp-stones.

Dr. Darby.—I had hoped that the paper which has been read would elicit discussion in the line of the causes which produce pulp-nodules. Undoubtedly it is the result of irritation, but just why irritation should sometimes produce calcification of pulp-tissue and at other times death I am unable to say. Whether the same causes which produce hypercementosis upon the roots of teeth, would produce calcific deposits within the pulp-chamber I am also unable to determine.

There have been periods in my practice when I have met with a large number of cases of pulp-nodules, they seeming to follow each other in rapid succession, and then again I would not meet with one for years. I recall one very interesting case which

came under my observation some years ago. It was in the mouth of a lady perhaps thirty years of age. A first superior molar had been the seat of much pain. The tooth had but one filling, and that a small gold one, upon the masticating surface. It had been inserted in childhood. There was nothing about the tooth to indicate that it was the seat of the severe pain which the patient complained of, and yet there was nothing else in the mouth more suspicious. Anxious to ascertain the condition of the cavity beneath the filling, it was removed, and the cavity found to be shallow. Gutta-percha was substituted for gold, but the pain continued, and a drill was made to approach the pulp-chamber, when arsenic was applied. After two or more fruitless efforts to thus devitalize the pulp, I determined to anæsthetize my patient and open the pulp-chamber, which I did, and found it completely filled with pulp-nodules.

Dr. Kirk.—I rise to corroborate the statement of Dr. Peirce, made some time ago before this Society, as to the enlargement of the pulp-chamber. I was present at the meeting when Dr. Peirce made that statement, fully five or six years ago. I told it to a number of histologists, and they hooted at it, but I still believed in it, because it seemed to me reasonable, and because of my faith in the accuracy of Dr. Peirce as an observer. In a recent paper by Dr. Caush, of Brighton, England, he treats of the morphological changes which take place and the conditions which Dr. Peirce described.

Dr. Gaskill.—I would mention the case of a young man whom I treated about two years ago, which illustrates the absorptive power of the pulp. There was a small pink spot on the face of the central incisor, but no cavity, or pain to indicate irritation. I saw the case frequently, and in about six weeks after the first visit he expressed himself to the effect that the bottom had broken out of the tooth. On examination it was found that the palatine wall had crushed in completely from mastication. After taking out the small laminae of enamel which still remained, I found that absorption had gone on exposing the pulp; the canal and apical foramen were also quite large. On the labial side of the pulp-chamber absorption had advanced so far as to allow me to see the outline of an instrument through the enamel.

Dr. McQuillen.—I think all deep-seated cavities in vital teeth should be lined before inserting metallic fillings; if that were done there would be less trouble from calcific deposits in the teeth.

Dr. Faught called attention to the fact that Miller's preparation, for application to pulp-canals where it was found impossible to

remove all the pulp, could be obtained at Watt's drug store, Broad above Chestnut Street.

The meeting then closed, and the members partook of the refreshments provided.

WOMAN'S DENTAL ASSOCIATION OF THE UNITED STATES.

THE regular monthly meeting of the Woman's Dental Association of the United States was held at 1300 Arch Street, Philadelphia, October 7, 1893, Dr. Mary H. Stilwell, President, in the chair.

The minutes of the previous meeting were approved as read by the Recording Secretary.

The Corresponding Secretary announced a letter from Dr. Kate C. Moody, of Los Angeles, California, stating the cause of not sending a report to the Chicago meeting was the delay in the mail. Did not receive notice in time.

Dr. Davis, chairman of the Executive Committee, presented nine new names for membership: Drs. A. H. Graham, La Crosse, Wis.; G. S. Bright, New York City; Sarah E. Gardiner, Laramie, Wyo.; Mary Weston, Kansas City, Mo.; Ethelyn Phillips, Chicago, Ill.; Hester J. Baker, Quincy, Ill.; Cora G. Little, Holdredge, Neb.; Sarah Mary Townsend, Denver, Col.; Thelka Stein-Reuter, Madison, Wis.

On motion, reports were accepted.

A motion was made and adopted that the Recording Secretary cast the vote to elect these new applicants as members.

The President introduced Dr. C. N. Peirce, who read a paper on "Dental Diagnosis."

MRS. PRESIDENT AND MEMBERS OF THE WOMAN'S DENTAL ASSOCIATION OF THE UNITED STATES,—Before presenting the paper prepared for the evening you will allow me to congratulate you and your associates upon the position which your Association has attained, also upon its membership, and the interest which it is manifesting in professional improvement and growth. As it is sometimes profitable to recognize the previous condition and the factors which have been influential in making possible the present status, I would like to remind you that you have present this evening one whose contest with prejudice and bigotry and in favor of woman's right to a

dental education made the opportunities which we are to-night enjoying not only possible but practical. Twenty-five years ago, when the first woman presented herself for matriculation in the Pennsylvania College of Dental Surgery, such a storm was created around the heads of the applicant and her friends that one might have imagined a great catastrophe was impending; but after a time the fury of the storm abated, and when the smoke had cleared away it found your guest, Professor James Truman, victorious in the right, with Henriette Hirschfeld matriculated as the first woman student in the Pennsylvania College of Dental Surgery. Since that period some sixty women have been admitted, and now the woman dental student writes her name upon the matriculation book annually, and not a ripple is heard or seen upon the quiet waters.

Such is the history of every encroachment upon time-worn customs, but it is the brave heart and clear conscience that leads the way and breasts the storm. So I congratulate you, and am happy to be with you this evening.

(For Dr. Peirce's paper, see page 889.)

DISCUSSION.

Dr. James Truman.—The large number of earnest women present here this evening impresses me with the fact that but a comparatively few years have elapsed since the struggle was made and finished that opened the door for women to study this profession.

The courage of the women who first essayed the rôle of college-students it seems to me has never received the recognition deserved. It is no slight matter to brave public opinion, and the ideas prevalent on this subject thirty years ago were altogether different from those entertained at present. Everything then stood in the way of woman's advancement in the professions and in higher education. All classes of both men and women needed to be taught that there is no sex in knowledge, and to be trained for the results of the revolution then slowly in progress.

It is, therefore, with great gratification that I am able to meet such a large body of co-workers in a calling that was once regarded, by a class of medical men, as certain to undermine the health of all the women who undertook it.

The subject presented for our consideration by Professor Peirce is one of much importance, yet I do not know that I can add anything to the very full statement he has made. It seems, however, to be true that dentistry cannot be practised if there be a neglect in the study of cases as they present. It is to be feared

there is too much of routine work in practice, following day by day recognized procedures without much regard to general or systemic conditions or related facts. The origin and philosophy of pathological states need to be comprehended in every case, or failure, whole or partial, must result. Any other course is simply empiricism.

The study of irritations with their remote possible pathological results, the new foci of inflammation probable as the termination of all nerve disturbance, the action of ferments, the local and predisposing causes of disturbed function, must be sought for and properly correlated before intelligent conclusions can be reached.

The diagnosis, therefore, of the dentist cannot be limited to the oral cavity, but must comprise a general and thoughtful study of all related organs and inherited possibilities. To do this necessitates, as has been stated, education and experience; but unless the latter be combined with a study of possible contingencies and sources of disease it will not progress very far towards correct modes of treatment.

Dr. Brubaker.—If I have rightly comprehended the idea embodied in the writer's paper, it is that the diagnosis of any disease does not consist merely in the recognition of the pathological processes as they present themselves at the passing moment, but in the recognition also of all the antecedent causes which have been operative in the production of the pathological process, not only in the life of the individual but in the lives of his or her ancestors as well. Very frequently these causes are remote and obscure, and are to be sought for in those constitutional states or diatheses, such as the tubercular, arthritic, syphilitic, which, while active in one generation, lie dormant in the second, and reappear in some strange form in the third or fourth. This form of the general law of heredity must always be kept in mind in the investigation of the life-history of any disease. It is astonishing how frequently an apparently isolated disease has an invisible bond of connection with some ancestral disease and is dependent upon it. In order, therefore, that the diagnosis of any pathological state may be complete, and thus a satisfactory basis for a rational treatment be established, it is necessary that we possess not only a complete knowledge of its present condition but of the various phases through which it has passed, as well as those through which it will pass before it reaches its final termination. This, I conceive, would form a scientific basis for a rational system of therapeutics.

All diseases have for their production two sets of causes,—viz., internal or predisposing and external or exciting. So long as the

tissues possess their normal degree of vitality or are enabled to adjust themselves to variations in external conditions, so long will health, or the physiological state, be maintained, and disease, or the pathological state, be excluded. This is, however, an ideal condition and extremely difficult of maintenance. In every disease there is a time and a cause, near or remote, for the departure from the physiological condition. I conceive it to be the writer's idea that it is the duty of the diagnostician to seek out as far as possible this time and cause to obtain a complete history of the disease. Then and then only will it become possible to explain and successfully treat many dental diseases which at present elude all the therapeutic means at our disposal.

Dr. Emily Wyeth asked Dr. Peirce about an elongated tooth that came to her care, causing serious trouble.

Dr. Peirce.—Mechanical force applied with the abnormal condition may result in elongation; this causes the increase of the blood to that tooth, producing the trouble.

Dr. Focht cited several cases of incorrect diagnosis, made by the non-appearance of familiar signs, and asked, "Do we devitalize enough teeth? I cannot speak from my own experience, not having been in practice long, but is capping a safe practice? As many teeth presented have been filled and capped and in years afterwards give trouble, would it not be better to devitalize at once?"

Dr. Peirce.—In proportion to the number of teeth capped and giving no trouble for say five or eight years and the ease enjoyed for that length of time, I think there is much in favor of capping. Of course one must take into consideration certain conditions, temperament, climate, etc.

A question arising in connection with peridental trouble, caused by absorption at the apical foramen of a superior first bicuspid, was presented by Eliza Yerkes. Treatment prescribed, crystal chloride of zinc.

Discussion and incidents of office practice by Drs. Stilwell, Davis, and Miller.

A vote of thanks was tendered Professor Peirce for his able paper.

Meeting then adjourned, to meet November 4, 1893, at the same place.

ELIZA YERKES,
Recording Secretary.

Editorial.

TO WHOM BELONGS THE HONOR OF DISCOVERY?

THE progress of the world is so inextricably made up of atoms of thought, from the period of its earliest manifestations, that to analyze the complex relations of past and present becomes a problem difficult, if not impossible, of solution.

This fact has led many to condemn the idea that there is anything now for the world's workers to present worthy to be classed as novel. The arts lost in the mists of antiquity are an ever-present reminder that the world, in many of its presentations, exhibits an ever-continuing spiral revolution, the fact forgotten yesterday becoming the practical idea of to-day.

While this is unquestionably true, it would be worse than folly to ascribe the development of new things to a combination of the mental effort of former generations. The monuments of by-gone civilizations remind us of periods of growth and decay, but they at the same time show us with ever-increasing force that, while there has been a loss in some directions, the tendency of the world is towards a higher life and grander conception of art, morals, and material things. Were this not the case we might well despair, and adopt the pessimistic idea that progress is a myth, and that the end of the human race is eventually to be, as at the beginning, a lapse into barbarism.

It is to be feared that this view has led many to the unwise conclusion, that there is no such thing as original thought, and, even when this appears as such, it is merely a combination of previous ideas, which some one, more lucky than his fellows, has been able to present in a pleasant and useful form. With this as the governing idea it will be found impossible to convince a certain class of minds that the seeming original conception has any inherent right to be so considered or that the claimant to ownership is entitled to any honor for the successful issue of his labors.

Hence originates the laxity of morals that conceives it no crime to appropriate the ideas of another, and, while the same individual might hesitate to pick his neighbor's pocket or burglariously enter his house at night, he will unblushingly pilfer the coinage of his brain, and feel he has done nothing unworthy an honest man.

The nice ethical distinction often drawn between corporate, political, and professional conscience and the moral standing deemed necessary for Christian people to adopt in their intercourse with each other, is worthy of more consideration than it receives. It is unnecessary to enlarge upon this, but the want of principle involved in this code has become a baneful poison, insidious and far-reaching in its effects.

The question who may claim the honor of original discovery will ever remain a difficult one to answer, if this is meant to apply to one who has shown a capability of formulating an idea without the aid of the work of generations preceding him. To confine this within such narrow bounds would simply be placing an impassable barrier to all progress. The absurdity of this idea needs no comment.

Every investigator must make use of the machinery at his command as aids in development, but the materializing of his conceptions may nevertheless be above and beyond the thought and work of any preceding age.

It is certainly an error to suppose that a fractional idea constitutes an entire conception, yet this would seem to be the thought of many, for the moment a new invention or process is announced there arise numerous claimants for the honor of original discovery. When these claims are subjected to examination, they ordinarily prove to have been ideas in an inchoate condition and incapable of resulting in any form of value.

In illustration of this view it is only necessary to refer to several prominent instances. All are familiar with the history of the discovery of anæsthesia, by Horace Wells, and how the attempts to deprive him of this honor cost him his mental balance and his life. Yet Horace Wells had nothing to do with the discovery of the agent used. Keen observation and quick perception, rather than profound thought, led to the result, but it was just these qualities which enabled him to reason from cause to effect in advance of all others who had made use of nitrous oxide.

It is well known that, when Dr. Bonwill introduced the electric mallet, determined efforts were made to prove that others had preceded him, but, fortunately for justice, these attempts failed; yet Dr. Bonwill was indebted for much of his work, in fact could not have made the mallet, but for the results previously accomplished by electricians,—indeed, the click of the telegraph sounder suggested the idea to him.

Electricians failed to make use of their own discoveries in the

direction of sending messages, and it was reserved for Morse to point out the way and be received with deserved honor as the discoverer of the process of telegraphy.

The investigation into the origin of dental caries made slow progress, notwithstanding the work of histologists from Leeuwenhoek to Ficinus, Tomes and Klencke to Leber and Rottenstein, Milles and Underwood, and to the final work of Miller. The foundations were laid before the latter began his labors, but on these he builded better than those who had preceded him, and so thoroughly proved his work as he progressed, that the last word has been said upon the subject or its origin.

When Stebbins proved that nitrate of silver would stop the progress of caries, and demonstrated it by a series of exact and long-continued experiments in the mouth, there arose immediately claimants for the honor of this discovery from all points of the compass; but it was the old story over again, of imperfect experimentation, and missing the vital and important point as demonstrated in deciduous teeth by the real discoverer.

All who have done any labor in a given direction deserve and should receive due credit, but the man who proves his work or makes a practical machine, develops an idea, creates a new ideal in art, or opens up ways which will lead directly to uplifting the burdens of the human family, is a discoverer in the truest and best sense, a blessing to humanity and an honor to his age.

THE PASSING YEAR.

THIS number will close the work of the year and finish Volume XIV. of this journal.

The retrospect of a year's work invariably brings with it a commingling of pleasure and regret, in which both feelings are so closely intermingled that it is difficult, at times, to know which predominates. While this is probably true of every life and every occupation, it must, from the nature of the duties, be peculiarly the experience of those connected with journalistic work.

The labor here is never completed, but there are resting-places which afford time to review results, take stock, as it were, of its mental and scientific value, and draw a balance between the good and the bad, the talent that builds for the future and that which is ephemeral in character.

Reverting to the work peculiarly our own, it is with some degree of pride that we can point to twelve numbers of excellent material, much of it of a high order of merit from a scientific standard. The aim has been, from its inception, to make the journal the organ of the best thought of the dental profession, admitting nothing to its pages of a trivial character. This was regarded as in consonance with that higher standard which should be the effort of the best intelligence in dentistry to cultivate.

It would be untrue to say that our ideal of a dental periodical has been reached. The time has not yet arrived for this to appear. It will come when dentists are fully alive to their responsibilities as professional men, and are prepared to throw off the shackles of trade influence and the journals connected therewith. We have a great admiration for the energy displayed by our contemporaries, and regard the work performed as valuable, but it would be quite as reasonable to expect an outsider to represent the family, in all its peculiar and intimate relations, as to regard it possible for the so-called trade journals to represent the inner life of a large body of professional men.

We do not propose to argue this delicate point, but desire to impress our readers with the importance of special work in the direction of a better professional life. It is the one great weakness of dentistry. The indifference is sometimes appalling, and is, perhaps, more apparent to those obliged to work in the literature of our calling than to others not so favorably situated. It, however, shows itself everywhere, and the past year has demonstrated, as never before, the necessity for real missionary work in this direction.

To do this effectively there is no better agent than the monthly journal independent in all its relations, but to make this of value it must receive the cordial support of the entire body of dentists. Their first duty is to those of their own household.

As far as this journal is concerned we have no cause for serious complaint; indeed the outlook is most encouraging. The aid we have received from individuals and societies has been of the greatest value, and we desire to extend, in this general way, our earnest thanks for their co-operation in the work.

While thus encouraged, it is felt that the leaven of a higher standard is but slowly making its way into the thoughts and practice of the majority, and to this large number we must go, meet them in their daily work, cultivate by the evening fireside in many homes a taste for the scientific side of the profession they have adopted.

If this be the great need of the hour, is it asking too much for each one to constitute himself a special and self-appointed committee to rouse his immediate professional circle to greater activity in every direction? This is to be the principal work of the coming years.

The past is finished. The year 1893 has been one of great activity in certain directions, but whether this means a better professional life or otherwise is still a doubtful question. We have not much faith in spasmodic efforts. They are sure to be followed by periods of weakness. The only true advance is made slowly, securing every step before another is taken. In this way will each passing year show a gain and a material improvement in professional thought and work.

Bibliography.

A PRACTICAL TREATISE ON MECHANICAL DENTISTRY. By Joseph Richardson, M.D., D.D.S. Sixth Edition. Revised and edited by George W. Warren, D.D.S. With six hundred illustrations. P. Blakiston, Son & Co. Philadelphia, 1893.

The appearance of the sixth edition of this well-known work on mechanical dentistry will be received with gratification by the dental profession. It has for so long a period been a standard book on this subject that any lengthy review would seem unnecessary.

It is a satisfaction to find that the original work, so ably prepared by the lamented author, Dr. Richardson, has been carefully and thoroughly supplemented by the labor of Dr. Warren.

The task of preparing this edition must have been very heavy; indeed, it may be judged nearly equal to the original preparation. It is a pleasure to notice this careful revision, as it leads to the hope that future editions of other works published by this firm may receive similar treatment. There has been entirely too much of a repetition of old and obsolete matter from edition to edition, until publications have ceased to have any value either as text-books or works of reference.

Crown- and bridge-work has been so rapidly developed in recent years that a new edition required that this part should be almost entirely rewritten, and this has been accomplished in 202 pages,—

almost a book of itself. This work of the editor is in the main complete and satisfactory in the general processes given, but we look in vain for some regarded by experts as of special value, notably the movable bridge of Dr. Richmond; indeed the omission of the work of this excellent mechanician seems a positive mistake, and should be corrected in future editions. There is no part of a book that should be more carefully guarded than that of giving credit for original work.

The illustrations are profuse and generally excellent, but some from an artistic point of view are not worthy the pages upon which they are printed, the teeth in several instances resembling nothing in nature. Aside from these defects this part of the book is very well done, and exhibits great care to bring this difficult subject up to date, and at the same time make it clear to the reader.

While there may be a difference of opinion as to where the line should be drawn between operative and mechanical dentistry, it appears that certain processes usually claimed for the former belong, in part at least, to the latter. In this class may be placed the preparation of regulating plates. While these vary constantly to meet changing conditions, it is clear that the description of certain fixed forms would be of great advantage to the student. This has been entirely omitted in this edition.

The general make-up deserves the highest commendation, and corresponds in this respect with the very careful work of this publishing house.

This volume in the present as in the past preserves its reputation of being the only work on mechanical dentistry worthy to be heartily recommended as a text-book for students and for continual reference by those in practice.

Obituary.

DR. CHARLES W. KINGSLEY.

ALL the profession will learn with regret that Dr. Charles W. Kingsley died in Paris on the 22d of October. He was ill less than two weeks suffering from pneumonia and congestion of the lungs. The crisis was supposed to have been passed in safety, when heart-failure suddenly supervened.

Dr. Kingsley was born December 3, 1841, at Pittsford, Vermont. While preparing himself for college he earned the necessary fees by teaching, and, finally, while a student of the University of Rochester the Civil War began, and he enlisted in the Union Army in 1864, remaining until he was mustered out in 1865. In the same year he began the study of dentistry in the office of his brother, Dr. Norman W. Kingsley, and because of a natural aptitude rapidly became very skilful both as an operator and in other branches of dental work. He was the assistant and associate of his brother for five years, and in December, 1871, formed a partnership with Dr. Crane, in Paris. This partnership continued until it expired by limitation, thirteen years later, since which time he was in independent practice at No. 9 Rue Auber.

During his career in Europe Dr. Charles Kingsley acquired the distinction of being considered one of the most skilful Americans practising abroad, and rapidly obtained a very large and remunerative practice, his clientèle being of the most select order, including many of the nobility from various capitals of Europe, and the most distinguished Americans travelling abroad.

Among his brother dentists he was held in high esteem, and contributed as greatly as any towards maintaining the character, dignity, and good name of American dentists in Europe. He was vice-president of the American Dental Society in Paris, of which Dr. Thomas W. Evans is president.

He was a man of studious habits, refinement of manner and culture, a master of his profession, and of sterling integrity.

He married Miss Jessie Bradbrook in 1871, and she survives him. He also leaves two sons, the elder of which is at Yale University, and the younger at school in England. His body was cremated at Père la Chaise October 24.

R. OTTOLENGUI.

Domestic Correspondence.

EFFECT OF IMAGINATION.

CINCINNATI, OHIO, August 5, 1893.

TO THE EDITOR:

SIR,—I was much interested in reading Dr. Edward Page's article on "Amalgam," in the August number, especially so in the instances he cites showing the effect of imagination on the patient's

part, as regards the injurious effect of amalgam fillings. In 1877 I removed from a wisdom-tooth of a lady patient a large amalgam filling, which she declared caused her uneasiness, substituting gold. This she declared relieved her of symptoms of uneasiness of long standing. Nine years later the lingual wall of the tooth broke away, and the filling was lost. By this time I had forgotten about having removed the amalgam filling, and as the lady was in feeble health, unable to endure a protracted operation, I suggested amalgam. This was inserted accordingly, and was in position last week when she called for other services. Meanwhile, in casually looking through my record of operations for 1877, I discovered my notes on this particular case, and inquired whether she recalled the circumstances at that time, and if she had suffered a recurrence of the trouble since the insertion of the second amalgam filling. To both questions she replied in the negative. I should not omit to say that the pulp is still alive.

FRANK W. SAGE, D.D.S.

Notes and Comments.¹

"THE atmosphere we create has so keen an effect on those about us that our personal comments are, after all, but a reflection of ourselves. It is the jealous temperament that discovers defects; the critical temperament that sees all the faults; the provincial mind that carries the non-elastic six-inch rule to measure giants and pigmies; the generous mind that sees all perfection; the discriminating mind that sees the whole man."

THE TEST OF STRENGTH.—The following quotation, taken from a recent editorial in *The Outlook*, suggests some thoughts for the dentist. The writer, in speaking of women (though they be college graduates), often feeling as if their lives were limited by the petty details to which the mind of the housekeeper must give attention,

¹ The assistant editor solicits contributions for this department,—new methods, new remedies and formulas, or any short practical note which may prove of value to the practitioner or student. Address 1506 Arch Street, Philadelphia.

says, "The every-day detail inseparable from the administration of a household, large or small, makes the sum total of its mistress's happiness. To neglect or overlook the smallest detail for one day means double care, or increase of friction, for the days that follow. It is the omission of the pinch of salt that spoils the dinner. It is the care of the trifling things, the small essentials, that marks the difference between a well-organized and a disorganized home."

Now, to apply this to ourselves. Every one must learn that it is the care and nicety of attention with which details are met that makes the difference between well-applied intelligence and ignorance, or its equivalent, indifference. It is our ability to attend to details perfectly, that is, in order and without producing friction, or to train others to attend to them in the same spirit, which marks the difference between the successful and the unsuccessful man.

In our colleges too, this matter of details is of greater importance than is usually accorded it. Teachers sometimes fail to make their work a success in that they slight the little things. By giving more attention to the details, students are better able to grasp the subject, comprehend the teaching, and they make more practical men, thus doing greater credit to the school.

Not infrequently are colleges and universities compared according to the appearance of their buildings, and the amount of noise they make in the community. It is too often forgotten that schools of any kind are only valuable to the world in what they produce.

DRILLING CAVITIES IN ARTIFICIAL TEETH.—Dr. E. T. Davis, of Bridgeton, N. J., writes us upon this subject as follows: "Many of us, not being convenient to the dental depots, should be able to prepare the cavities ourselves. I find this can be done very nicely by using an inverted cone or wheel drill (on the engine), which must be kept wet with spirits of turpentine. In this way the cavity, under-cuts, and retaining pits can be made without any trouble."

While this, in the hands of some, may give good results, the ordinary diamond stone and drill will give more universal satisfaction.

PYORRHŒA ALVEOLARIS—AN IMPORTANT ANNOUNCEMENT.—At the regular meeting of the New York Odontological Society, held November 21, 1893, Professor C. N. Peirce, of Philadelphia, read a paper on the "Etiology of Pyorrhœa Alveolaris," in which he stated that, in the effort to reduce this disease to its simplest factors and deter-

mine the primary origin of each, he should coin two terms, which he thought would be more expressive as to the true nature of the disease. He believed that in one form of calcic pericementitis the origin of the salt was the saliva, and in the other form, the blood; the former he therefore designated as ptyalo-genic calcic pericementitis, expressing the idea that in its origin it is local, peripheral, and salivary; the latter he designated as hæmato-genic calcic pericementitis, expressive of the idea that in its origin it is constitutional, central, and associated with some modification of the normal composite of the blood-plasma. This latter he believed was the condition in true pyorrhœa. In this he suggested that possibly some chemical agent derived from the blood, the product of some morbid constitutional state, might be the exciting cause. With the view of testing the plausibility of this assumption, he had the deposit removed from the apical extremities of teeth which had been sacrificed by this so-called pyorrhœa, and subjected to chemical analysis. In every instance the chemical methods employed revealed the fact that the deposit was a combination of calcic urate, sodic urate, with some calcic phosphate and carbonate. *The existence of the urates, in which the uric acid is the predominating element, shows that this deposit is a precipitate from the blood exudation and the irritation of constitutional origin*, the disease, if these analyses are confirmed by subsequent experiments, being but another phase of the uric acid or gouty diathesis. These deposits were examined by Professor Ernest Congdon, of the Drexel Institute, whose experimental skill is a sufficient guarantee for the accuracy of the results obtained, and subsequently repeated by Professor A. P. Brubaker with the same results.

Current News.

THE UNIVERSITY OF PENNSYLVANIA.

ALL the Departments of this institution have now been arranged upon a similar basis as regards length of course. The extension of the Department of Dentistry to eight months brings them all into harmonious working order. Beginning with the present session, the winter sessions of each will commence October 1, and close the first week in June.

RECENT PATENTS.

FOLLOWING is a list of recent patents, reported specially for the INTERNATIONAL DENTAL JOURNAL:

500,139.—Dental Engine. Roswell De L. King, New York, N. Y. Filed September 24, 1892.

501,075.—Dental Engine. William A. Johnston and Arthur W. Browne, Prince's Bay, N. Y., assignors to the S. S. White Dental Manufacturing Company, Philadelphia, Pa. Filed March 16, 1893.

501,127.—Dental Tool. Henry C. Wofford, Greenville, S. C. Filed October 27, 1892.

501,429.—Artificial Tooth. Max J. F. Kneiff, Berlin, Germany. Filed August 2, 1892.

501,741.—Dental Articulator. George W. Simpson, Santa Barbara, Cal. Filed September 22, 1892.

502,164.—Dental Articulation-Cup. George K. Bagby, New Berne, N. C. Filed November 26, 1892.

502,209.—Apparatus for casting Aluminum Dental Plates. Warren M. Sharp, Binghamton, N. Y. Filed February 10, 1893.

502,352.—Dental Plugger. Alonzo A. Dillehay, Meridian, Miss. Filed June 7, 1892.

503,258.—Dental Disk and Carrier. Rufus G. Stanbrough, New York, N. Y. Filed January 29, 1892. Renewed January 18, 1893.

503,419.—Preparing Dental Fillings. Albert W. Johnston, New Brighton, N. Y., assignor to the S. S. White Dental Manufacturing Company, Philadelphia, Pa. Filed January 16, 1893.

503,737.—Dental Engine. Arthur W. Browne, Prince's Bay, N. Y., assignor to the S. S. White Dental Manufacturing Company, Philadelphia, Pa. Filed April 29, 1893.

503,740.—Dental Engine. Constant Doriot, Philadelphia, Pa., assignor to the S. S. White Dental Manufacturing Company, same place. Filed March 2, 1893.

503,744.—Dental Drill. Woodbury S. How, Philadelphia, Pa., assignor to the S. S. White Dental Manufacturing Company, same place. Filed June 26, 1893.

503,826.—Artificial-Tooth Mould. Robert Brewster, New Barnet, England. Filed April 17, 1893.

504,126.—Artificial Tooth. Charles C. Dure, Plymouth, Ind. Filed April 18, 1893.

504,487.—Dental Engine. Benoni S. Brown, Hyde Park, Mass.,

assignor to the S. S. White Dental Manufacturing Company, Philadelphia, Pa. Filed March 26, 1890.

504,489.—Dental Plugger. Constant Doriot, Philadelphia, Pa., assignor to the S. S. White Dental Manufacturing Company, same place. Filed March 9, 1893.

504,490.—Dental Engine. Constant Doriot, Philadelphia, Pa., assignor to the S. S. White Dental Manufacturing Company, same place. Filed March 11, 1893.

504,491.—Dental Engine. Constant Doriot, Philadelphia, Pa., assignor to the S. S. White Dental Manufacturing Company, same place. Filed March 13, 1893.

505,121.—Dental Disk-Holder. Edward Nelson, Frederick, Md. Filed January 11, 1893.

505,490.—Dental Disk-Holder. Rufus G. Stanbrough, New York, N. Y. Filed April 4, 1892.

506,200.—Dental Chair. George W. Archer, Rochester, N. Y., assignor to the Archer Manufacturing Company, same place. Filed October 7, 1892.

506,350.—Dental Disk-Holder. William H. Towne, Worcester, Mass., assignor to the S. S. White Dental Manufacturing Company, Philadelphia, Pa. Filed June 26, 1893.

506,522.—Dental Apparatus for grinding Teeth. Daniel E. Morse, New York, N. Y. Filed August 15, 1893.

506,762.—Process of securing Dental Suction-Valves to Plates. Alfred E. Abrens, Stratford, Canada. Filed May 18, 1893.

Reissue.—11,376.—Dental Engine. John S. Campbell, London, England, assignor to Edward A. Pierce, New York, J. Otis Cox, Brooklyn, and the Carroll Aluminum Manufacturing Company, New York, N. Y. Filed December 17, 1889. Original No., 397,169, dated February 5, 1889. Patented in England March 26, 1888, and in France May 31, 1888.

Designs.—22,668.—Dental Clasp. John Kerr, Detroit, Mich., assignor to the Detroit Dental Manufacturing Company, same place. Filed June 5, 1893. Term of patent 7 years.

Trade-Marks.—23,276.—Dental Dams. I. B. Kleinert Rubber Company, New York, N. Y. Filed May 20, 1893. Essential feature, the word "Kleinert" on the representation of a Maltese cross.

23,402.—Anæsthetics. Charles E. Hale, Boston, Mass. Filed June 14, 1893. Essential feature, the words "Hale Method."

23,486.—Dentifrice. S. C. Wells & Co., Le Roy, N. Y. Filed June 9, 1893. Essential feature, the shaded representation of a scalloped shell, and a short word printed thereon.

23,558.—Tooth-Wash. James W. Johnson, New York, N. Y. Filed June 29, 1893. Essential feature, the word "Lavodent."

23,723.—Tooth-Paste. Joseph Spyer, Chicago, Ill. Filed July 21, 1893. Essential feature, the word "Mexican" arranged within a circle.

Selections.

A STATEMENT OF SOME FACTS IN REGARD TO THE ORIGIN OF THE PRACTICAL APPLICATION OF AN- ÆSTHESIA IN SURGERY.

BOSTON, October 2, 1893.

THAT sulphuric ether was repeatedly used as an anæsthetic by Dr. Long, of Athens, Georgia, in his surgical practice as early as 1840 seems indisputable from the reliable evidence collected and published by the late Dr. Marion Sims, of New York, but a few years ago.

The fact that Dr. Long did not publish it to the world does not affect the priority of its use.

Next comes, about four or five years later, the experimental discovery and practical application by Dr. Wells, of Hartford, Connecticut, of the anæsthetic properties of nitrous oxide gas.

Then come facts known to me personally, as I was "behind the scenes." About a year or more later, Dr. Morton, remembering vaguely that Dr. Wells had faith in anæsthesia by the inhalation of something, applied to Dr. Jackson with the inquiry if there was anything that could be so used. Dr. Jackson informed him that in his personal experience sulphuric ether had relieved his suffering from the accidental breathing of chlorine gas, adding a caution in regard to its use. Dr. Morton, finding Dr. Jackson's information correct in regard to the "letheal" effects of sulphuric ether, by persuasion induced Dr. Jackson to unite with him in procuring a patent to control its use. Dr. Jackson's medical friends reminding him of the breach of ethics in getting such a patent, he withdrew from the patent. It was *then* that Dr. Morton claimed the sole discovery of ether anæsthesia, and, wishing to have some other respectable backing, he went to Dr. John C. Warren, then the head of the surgical staff of the Massachusetts General Hospital, and said, in his persuasive way, that he had discovered a "compound," which

he called "letheon," that would prevent pain in surgical operations, and would be pleased to show its effects on some hospital patient.

Dr. Warren consented to the trial, which proved successful; but he, with the rest of the staff, declined to adopt or endorse it unless they knew what it actually was. Of course, Dr. Morton had to tell them that it was sulphuric ether. They then began its use; and it was *their endorsement* which gave it the successful start in the surgical world, without which it is very probable it might have fallen into the list of empirical fancies.

The summing up of these facts seems like this: First, Dr. Long's successful private practice, followed after several years by Dr. Wells's success, which his diffident nature hindered him from pushing to notoriety. Then Dr. Jackson's instruction to Dr. Morton, which he followed out and brought to the notice of Dr. Warren and the surgical staff of the Massachusetts General Hospital; which staff, having eliminated its elements of quackery, tried effectually, and with their substantial endorsement gave it to the world. To that *endorsement*, it seems, is due the permanent consideration that anæsthesia has since received.

JACOB L. WILLIAMS, M.D.

—*Boston Medical and Surgical Journal.*

THE HYDROGEN DIOXIDE CONTROVERSY.

AN acrid controversy in regard to the availability of hydrogen dioxide (commonly called peroxide of hydrogen), has arisen between a prominent New York physician and a manufacturer of this product, which seems to call for brief comment, since the writer has been using it continuously for the past seven years. His first published paper appeared September 1, 1888 (*Philadelphia Medical Times*), and his conclusions, therefore, may be accepted as representing the results of clinical observation during that period.

Hydrogen dioxide is relatively, but not absolutely, harmless, pointed out as long ago as 1862, by Dr. Benjamin Ward Richardson. Like mercury, it will cause the teeth to become loose, and that the writer has witnessed in the case of a patient who deemed himself capable of self-medication; but a freshly-prepared product, free from an excess of acid and other impurities, properly used, is absolutely harmless. In suitable strength—one part to six to ten of

the fifteen-volume solution—it is a useful and efficient remedy in diphtheria,—that is, a solution conforming to the above requirements. Not being a stable article, a solution which is reliable to-day may be worthless, irritating, or even poisonous to-morrow. Any solution when combined with a comparatively pure glycerin and allowed to stand, will produce an irritant action similar to formic acid, but this is not due to the faulty character of the dioxide; it is owing to the chemical changes resulting from oxidation.

In the treatment of nasal catarrh occurring in debilitated subjects, where the tissues are relaxed and “juicy,” a weak solution causes burning and smarting, although it removes every vestige of accumulated mucus. To overcome this, it is advisable to employ a petroleum spray, plain or suitably medicated, or, in the absence of an atomizer, a colorless petroleum ointment may be substituted.

In diphtheria the same course is pursued, but we must bear in mind that while diphtheria is at first a local affection, poisonous products are rapidly absorbed from the seat of disease, so that in the course of a few hours it presents all the symptoms of constitutional infection. Internal medication is imperatively demanded to counteract the toxic action of the pathogenic micro-organism associated with the disease, over which local treatment has no influence whatever.

Knowing the exceedingly vascular character of the nasal mucous structures and the large amount of moisture eliminated by them, we do not have far to go for an explanation of the bad effects following the use of hydrogen dioxide. The fault rests entirely with internal medication, because thorough cleansing of the diseased area only opens the sluice-way for increased elimination of poisons, and we have a clinical paradox. The efficacy of the remedy is its only disadvantage.—*Editorial in American Therapist.*

RESEARCHES IN BACTERIOLOGY.

TO-DAY bacteriology is about to revolutionize medicine by elaborating a specific treatment of the infectious diseases.

The demonstration that pathogenic bacteria are virulent on account of their chemical products, and the study of the toxins and toxalbumens of infectious diseases, led to the discovery of antitoxines in the blood of animals immune against certain diseases, and these antitoxines were found to have an unexpected antidotal

power. The researches of Büchner, Martin, Hankin, Nuttall, and others paved the way for the demonstration by Ogata and Jashuhara that the injection of a drop of blood from an immune frog will protect a mouse against an ordinary fatal anthrax inoculation, and then Behring and Kitasato showed that the blood of animals immune against tetanus and diphtheria, if injected into susceptible animals, prevents fatal infection with virulent cultures of the bacilli of these diseases; suitable experiments readily showed that the toxalbumen of the tetanus bacillus is neutralized when mixed with the blood of immune animals, and the next step was the isolation of the tetanus-antitoxine by Tizzoni and Cantani and the successful treatment of actual cases of traumatic tetanus by means of tetanus-antitoxine injections. Already six cases successfully treated by this novel and specific but absolutely scientific method have been recorded in medical literature, the first one being reported by Rudolph Schwartz.

G. and F. Klemperer then showed that the blood-serum of animals artificially immune against croupous pneumonia renders susceptible animals immune, and that it has a direct curative effect if injected after the development of the disease. Preliminary communications are at hand announcing the discovery of antitoxines antidotal to tuberculosis and to rabies, and numerous ingenious experiments are constantly being made demonstrating that acquired immunity is due to the development of antitoxines. Recently Sternberg has demonstrated by proper experiments that the blood-serum of calves immune by previous attacks of vaccinia to vaccine virus contains something which neutralizes humanized or bovine lymph.—*Editorial in Journal American Medical Association.*

TO DEODORIZE IODOFORM, CREOSOTE, AND GUAIACOL.

THE odor of iodoform, creosote, or guaiacol upon the hands can be overcome by washing with linseed meal. Articles having an odor of iodoform may be washed in tar-water to which oil of wintergreen has been added. The taste of pills of creosote can be disguised by means of a little powdered coffee. The odor of iodoform or guaiacol in rooms can be dissipated by burning coffee.—*Deutsche Medizinal Zeitung (Medical News).*

PHENOCOLL HYDROCHLORIDE AS A LOCAL APPLICATION.

A PAPER by Dr. Carl Beck, in the *New York Medical Journal*, April 22, presents an argument in favor of the antiseptic external use of the drug named in the caption. He finds in this drug a good substitute for iodoform, probably as powerful as the latter, and rather more so than aristol, dermatol, iodol, pyoktanin, and some others that have been coming to us from Germany during the past year. Apart from the question of strength, the author prefers phenocoll to iodoform for the following reasons: the former is devoid of odor; it is readily soluble in hot water; it does not irritate the sound skin; it is not contra-indicated in cases of kidney-disease; it can be safely applied over extensive surfaces, as of burns or ulcers; it is potent in comparatively low percentages of strength. When Dr. Beck began the external use of this substance, he dusted the undiluted powder over the wounded surfaces and then applied a layer of sterilized moss or gauze. Although this treatment was followed by no irritation of the integument and by no symptoms of toxic impression, he found that he obtained equally good results, in many cases, from a ten-per-cent. gauze; so that latterly he has limited himself to the use of the phenocollated gauze. This can be used on recent wounds and on granulating surfaces; the layer of gauze should be thin and as a rule be protected by a piece of sterilized moss. The dressing may be renewed once in three days, for there is not an excessive discharge from surfaces thus managed. The process of healing does not vary much from that observed under iodoform. The urine was frequently examined in the case of each one of this series of cases, numbering over one hundred, with negative results as to the discovery of any renal disturbance referable to the drug. In fact, albuminous urine has not very frequently been caused by its internal administration as an antipyretic or antirheumatic, which have heretofore been the best known uses of phenocoll hydrochloride.

The report of Dr. Beck covers the experience of three months at St. Mark's Hospital and the German Poliklinik of New York, and is the first instalment of researches that are still being carried out with regard to the antiseptic powers of the drug named, as well as others of the synthetic series.—*Journ. Amer. Med. Assoc.*

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FIG. 1.

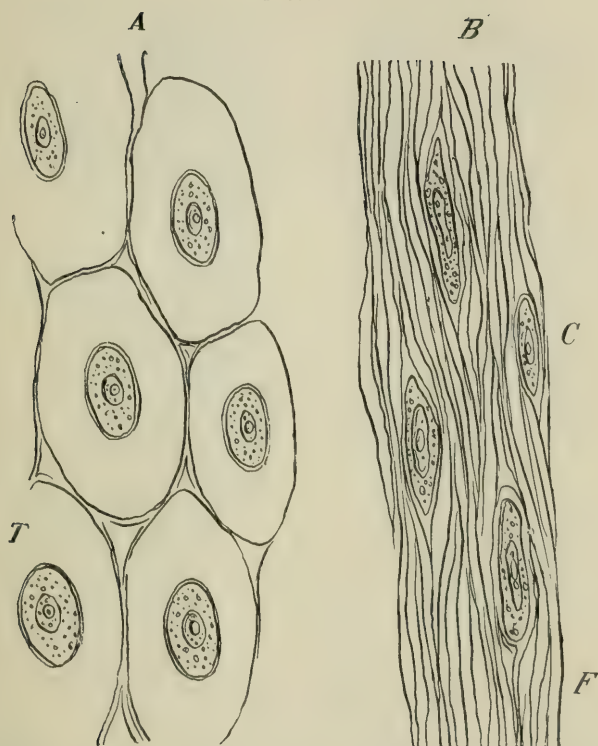


DIAGRAM OF THE STRUCTURE OF CONNECTIVE TISSUE, ACCORDING TO R. VIRCHOW (1852).—
A, structure and development of reticular cartilage: *T*, territory of the cell, called intercellular substance, considered inert and a product of secretion of the cell: *B*, structure and development of fibrous connective tissue: *C*, nucleated cell, lying in a cavity: *F*, fibres around the cell, considered inert glue and a product of secretion of the cells.

FIG. 2.

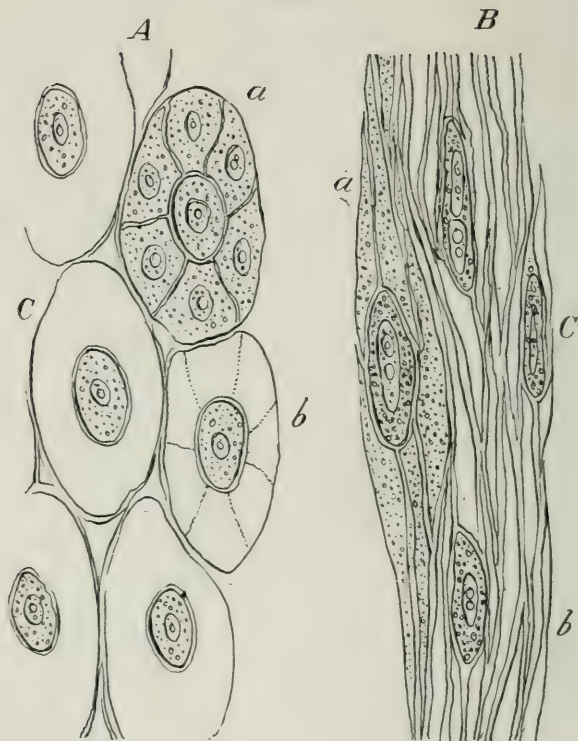


DIAGRAM OF THE STRUCTURE OF CONNECTIVE TISSUE, ACCORDING TO MAX SCHULTZE (1861).—*A*, structure and development of reticular cartilage; *a*, territory originally composed of a number of embryonal corpuscles,—protoplasm; *b*, peripheral protoplasmic bodies transformed into inert glue-yielding basis-substance; the central protoplasmic body left unchanged,—cartilage cell; *c*, fully-developed territory. *B*, structure and development of fibrous connective tissue; *a*, elongated protoplasmic bodies around the central cell; *b*, fibrous basis-substance, the product of a chemical transformation of protoplasm; *c*, unchanged granular and nucleated protoplasm, the connective tissue cell.

FIG. 3.

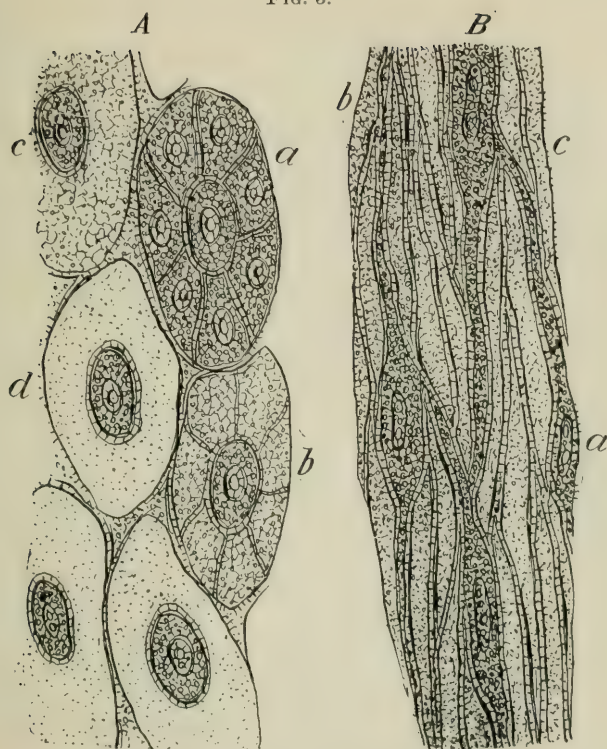


DIAGRAM OF THE STRUCTURE OF CONNECTIVE TISSUE ACCORDING TO C. HEITZMANN (1873).
 —A, structure and development of reticular cartilage; *a*, territory originally composed of a number of embryonic corpuscles,—protoplasm containing a reticulum of living matter; *b*, peripheral protoplasmic bodies in the beginning infiltrated with glue-yielding basis-substance, the chemical change taking place in the fluid, filling the meshes of the reticulum; the central protoplasmic body left unchanged,—cartilage corpuscle; *c*, infiltration with basis-substance further advanced; *d*, infiltration with basis-substance accomplished; the reticulum present, but rendered invisible. B, structure and development of fibrous connective tissue; *a*, branching and interconnecting protoplasmic tracts; *b*, fibres composed of protoplasmic spindles, holding the reticulum of living matter, all interconnected by living matter; *c*, advanced infiltration with basis-substance; the reticulum present, but rendered invisible.

FIG. 4.

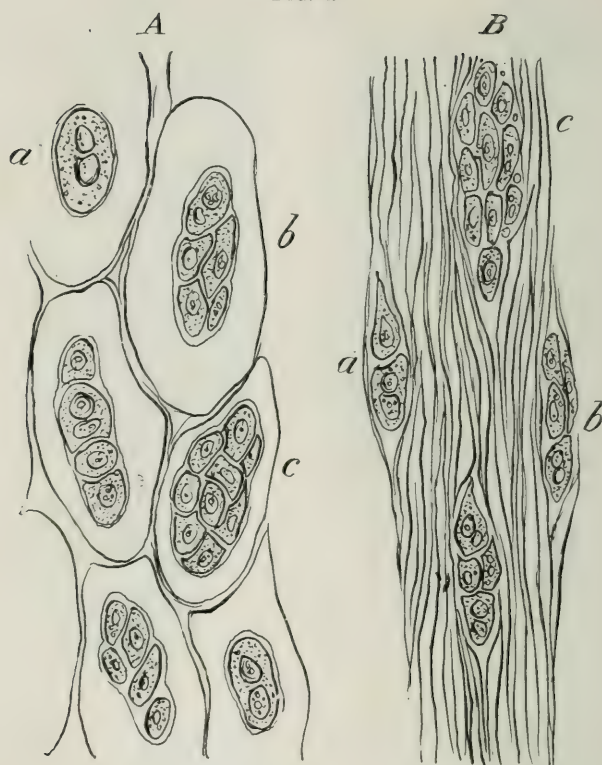


DIAGRAM OF THE INFLAMMATORY CHANGES OF CONNECTIVE TISSUE. CELL-PROLIFERATION ACCORDING TO R. VIRCHOW (1852).—*A*, inflammatory changes of reticular cartilage; *a*, division of the nucleus of the cartilage-cell; *b*, division of the cell into a number of cells; *c*, proliferation of cells,—the intercellular substance gradually liquefied. *B*, inflammatory changes of fibrous connective tissue: *a*, division of the connective tissue cell; *b*, further advanced division of the connective tissue cell; *c*, high degree of division and proliferation,—the fibrous intercellular substance gradually liquefied.

FIG. 5.

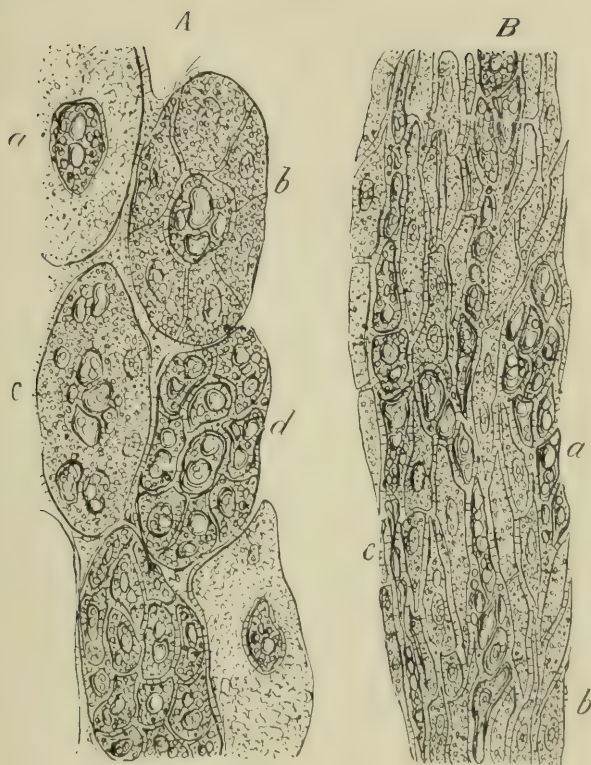


DIAGRAM OF THE INFLAMMATORY CHANGES OF CONNECTIVE TISSUE. REDUCTION OF BASIS-SUBSTANCE TO PROTOPLASM ACCORDING TO C. HILTZMANN (1873).—*A*, inflammatory changes of reticular cartilage: *a*, increase of the living matter in the central protoplasmic body; beginning reappearance of living matter in the basis-substance; *b*, territory composed of embryonal corpuscles, after liquefaction of basis-substance; *c*, reappearance of nuclei in the basis-substance; *d*, territory broken up to inflammatory corpuscles. *B*, inflammatory changes of fibrous connective tissue; *a*, original protoplasmic tracts broken up to inflammatory corpuscles; *b*, fibrous basis-substance transformed to nucleated protoplasmic bodies, —the “slumbering cells” of P. Grawitz; *c*, inflammatory infiltration; all the elements interconnected by threads of living matter.

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